Historic heritage of high-country pastoralism: South Island up to 1948

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Note on place names:
The place names mentioned in this publication are presented as they were reported in historical documents. Thus they are not necessarily the official place names as currently recognised by Land Information New Zealand.

Cover: Aerial oblique of Lake Guyon, which is a part of St James Station, one of the Amuri runs. View to the northwest. The homestead area is the open patch on the north side of the lake (see Fig. 8). Note pattern of repeatedly fired beech forest now reverting to bracken.
Photo: Kevin L. Jones, Department of Conservation.

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Preface

This report was commissioned to assist in providing an historical overview for the assessment of historic heritage during high-country tenure reviews. Reviews occur when a pastoral leaseholder decides to enter the process. After an assessment, the pastoral leaseholder is offered some areas in freehold and the Crown designates those areas that were assessed as having conservation values as conservation land. There needs to be complete agreement for tenure review to proceed. An assessment is made of both ecological and historic heritage values. There has been no previous overview of the South Island high-country history that focuses on historic heritage from the earliest Polynesian impacts through to the effects of mid-20th century technology. Such a report cannot be comprehensive, covering all the high-country pastoral leases from Southland to Marlborough. Each tenure review needs a lease-specific survey. It is hoped that this overview will provide information that is useful for the process, particularly for staff newly engaged in the process.

PROCESS

The Department of Conservation (DOC) has been making these assessments for some time and the process used has been robust. Many of the photographs and points raised in this report were included after discussion with conservancy staff. It is worth reinforcing that, on tangata whenua assessments involving Kai Tahu whanui, this report is simply an adjunct to the consultation processes already developed. The H.K. Taiaroa 1880–81 record of mahika kai sites is invaluable. It provides vital information on the high country and should be consulted. The details are available with the agreement of Kai Tahu through DOC's Pou Kura Taiao network.

SPECIFICS: THE HISTORICAL OVERVIEW

Previous writings on the high country are uneven in quality but considerable. The intention here is not to reproduce or challenge those; rather, it is to provide some sort of synthesis that helps to explain the existence of current relict landscapes. The report divides high-country history into six periods, as follows:

1. Pre-1840: Polynesian migration and settlement
2. 1840s–1870s: Extraction and exploitation
3. 1870s–1880s: Development and degradation
4. 1891–1912: The Liberal era
5. 1912–1935: Science, technology and soil conservation
6. 1935–1948: High-country management and the soil conservation movement

The reference section reflects the main sources consulted in the study. Roberta McIntyre undertook this report on a part-time basis over 18 months in 2002–04. The project was initiated by Paul Dingwall, Kevin L. Jones and Tony Nightingale of the Science and Research Unit (now Research, Development & Improvement Division), DOC, Wellington.

Historic heritage of high-country pastoralism: South Island up to 1948

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ABSTRACT

This report examines changes in the South Island high country of New Zealand from the time of the arrival of Polynesians up to 1948. At first, much of the land was forest-covered; extensive grasslands existed only in the dry basins of Central Otago and the Mackenzie Country. With the exception of moa, grazing and browsing animals were absent. With the arrival of Polynesians, who hunted and gathered food and extracted stone from the high country, and later European graziers, forests were fired, and almost the entire high country was transformed into tussock grasslands and dry scrub. Maori ownership and association with the land gradually declined. Europeans introduced grazing and browsing animals and also, as the natural grasslands became depleted, exotic plant species to improve pasture. Wool was the main product. Animal pests, such as rabbits, pigs and goats, and unwanted plants, such as broom and sweet briar, invaded. Animal diseases, especially scab, spread rapidly. The pastoral industry was challenged for a brief period by the gold-mining industry. Land fertility and stock numbers declined, and from the late 19th century the State intervened increasingly, employing scientific methods in an effort to resolve these problems. By the early 20th century, the mining industry had waned and tourism and hydroelectricity production were becoming more important. Many high-country slopes had eroded and in the 1940s the soil conservation movement emerged as a force that diminished the political power of the runholders.

Keywords: Maori, moa, greenstone, tussock grasslands, Crown pastoral leasehold, burning off, wool, gold, pests, soil erosion

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1. Introduction

The Department of Conservation (DOC) is currently involved in land tenure reviews of the high country of the South Island. In the process of converting Crown pastoral leasehold land to freehold land, lessees negotiate with the Crown to return full ownership of some areas to the Crown. Land returned includes sites of historical significance. In certain circumstances, specific assets on land that would otherwise be freeholded are retained by the Crown. As part of the process, DOC requires information about the relative priority to be accorded various historic sites/assets.

Present-day Crown pastoral leasehold lands are focussed in the South Island high country, but in the 1850s, when land was first taken up, leaseholds were initially concentrated on the eastern seaboard of the South Island. As population pressure on colonial lands grew, pastoralists began to penetrate the river valleys, hills and mountains inland. By the 1870s, agriculture was an increasingly dominant feature of the South Island lowlands and land managed under Crown pastoral leasehold retreated inexorably to the high country. Today, that leasehold land continues to shrink with the conversion of some of the Crown grazing land to freehold and some to conservation land. This study aims to define the South Island high country and to provide a contextual history of the human occupation and use of these lands.

The South Island high country can be defined in a variety of ways. Anthropologist Michèle Dominy described it as remote, high-altitude land, which is difficult to access, exposed to severe weather and liable to snowfalls. Sheep may be grazed there in the summer, but in autumn they are taken to lower land (Dominy 2001). Geographer Kenneth Cumberland (1944) defined the South Island high country as a 40-mile-wide strip of mountain land east of the Main Divide extending from Cook Strait to Te Anau. He stated that north of the Waitaki River, the greywacke mountains are jagged and steep; south of the Waitaki River, the schist 'plateau' section of this region is lower and rounder with shallower valleys, although angular greywacke occurs widely at higher elevations between Lakes Wakatipu and Te Anau (Cumberland 1944). Sheep stations in the various areas differ so markedly that in the 1940s the South Island High Country Committee limited its definition of a high-country run to two common factors: 'a property on which the production of wool and store stock was the main source of income and which might be liable to losses from snow' (see McLeod 1980: 9–10). It is not possible to define the high country as exclusively 'tussock land', since patches of forest, which once extended to around 900 m in altitude, still remain, and it includes barren areas and pockets of other vegetation such as matagouri and kanuka. Nor is actual altitude a useful means of defining high country. Often, the land is above 300 m, but there are numerous valleys that are below this level, such as the upper Clutha Basin of Central Otago and some parts of the Mackenzie Country. Aspect is vitally significant in the high country since the difference between

a sunny and a shady slope can be critically important for the growth of feed. Winter country for grazing stock is defined by low altitude and also by its steep slope facing to the north (Dominy 2001).

David McLeod, a previous runholder at Grasmere and Cora Lynn Stations on the upper Waimakariri River, concluded that the high country comprises a fairly narrow strip of land on the eastern side of the Southern Alps, reaching from Marlborough to Southland, and includes a wide variety of runs (McLeod 1980). It extends from the rugged, rocky peaks of the Seaward Kaikouras to the vast ranges and valleys of Molesworth and St Helens (now united in one huge cattle station); the forested valleys close to the Main Divide (including Lake Sumner, Esk Head and Lochinvar Stations); the deep gorges of the Canterbury rivers—Waimakariri, Rakaia and Rangitata; the vast, desert-like basin of the Mackenzie Country with its towering peaks (even here there is a great range of land types, from the dry warm ranges of the eastern boundary to the steep rocks of Mount Cook Station); the dry hills of Central Otago; and the southern lakes, Wanaka, Hawea and Wakatipu (McLeod 1980). For the purposes of this study, I will be using McLeod's inclusive definition.

McLeod wrote that:

> 'The high country is still unique; there is no other place in the world where the life is quite the same, where man, dog and sheep are united in a partnership to live on the very fringe of habitable land and defy the elements which threaten them at every turn. Snow and ice, fire, flood, avalanche and landslide – we meet them all.'
>
> (McLeod 1980: 10–11)

Even today mechanical things are secondary to sheep, dogs, horses and men and their boots and saddles. In 1980, according to McLeod, the most profitable high-country stations were those employing the simplest management techniques, where the ancient art of extensive pastoral grazing had been preserved alongside concentration on the welfare of the stock (McLeod 1980). Betty Dick of Lilybank Station near Lake Tekapo informed us that even in the 1960s the roads had varied very little from the days of the first bullock wagons and that runholders still had to ride into their remote high-country stations as their grandparents did 100 years before (Dick 1964).

Although the number of runs in the high country is small, the entire area is large. Holdings are vast, often extending to thousands of hectares, and fine wool has been the main product (Dominy 2001). Almost all of the New Zealand high country is Crown pastoral leasehold land with small patches of front country as freehold. DOC already has considerable holdings in the high country, and the tenure review process will convert a larger area into public conservation land. This overview attempts to bring together a variety of published and unpublished sources in order to give a starting point for assessing relict landscapes. It is hoped that the information contained in this paper and its illustrations will offer some understanding of the historical background to the Crown pastoral leasehold land and assist in the identification and interpretation of historic sites.

2. Pre-1840: Polynesian migration and settlement

2.1 LANDSCAPE MODIFICATION

2.1.1 Arrival and settlement

The arrival date of the first East Polynesians to New Zealand, and the South Island high country, has been a source of controversy for more than 150 years. For example, in 1985 archaeologist Atholl Anderson stated that the first known occupation of southern New Zealand occurred in North Otago in the 10th century (Anderson 1985). However, in a more recent article published in 2002, he concluded that it seems that 'New Zealand and the outlying islands – was not reached by people until the twelfth or thirteenth century' (Anderson 2002: 24–25). He thought that a number of canoes containing probably several hundred people arrived, although not necessarily together.

Otago archaeologist Jill Hamel considered that 'most of the useful evidence suggests that Otago was settled by Polynesians at around the same time as the rest of the country' (Hamel 2001: 9), and that there are three differing hypotheses of New Zealand's settlement by Polynesians: early, orthodox and short prehistory. The early hypothesis suggests that the first people emigrated between AD 0 and 500, and that there was a flow of immigrants up until AD 1500. The orthodox hypothesis posits that colonisation must have happened at c. AD 800 to allow time for the population to increase, stone resources to be discovered and a trade network to be developed. However, because no sites have been securely dated to earlier than the 11th century, the orthodox hypothesis is no longer favoured, according to Hamel (2001). Rather, she argued (like Anderson 2002) that 'radiocarbon dating and environmental analyses support [the hypothesis of] a Short Prehistory starting about AD 1150, with the establishment of transient villages, especially along the southern coasts of the South Island' (Hamel 2001: 13).

Te Rapuwai people are generally thought to have been among the first to settle the entire South Island; another first migrant group is thought to have been the Kahui people. Anderson commented that Te Rapuwai 'are said to have fired the forests of Canterbury and Otago, to have hunted the moa and to have left behind many of the shell heaps scattered over the landscape' (Anderson 1985: 7). The same can be said for the next group to arrive, the Waitaha. They, too, hunted the moa and southern traditions attribute many drawings on the walls of rock shelters in the South Island to them (Anderson 1985).

Anderson (1985) remarked that it has been plausibly suggested that there were fairly frequent migrations into southern New Zealand, and that the people who arrived later tended to adopt the name of those amongst whom they settled. He argued that it is:

> '... likely that Te Rapuwai and Waitaha simply happened to be among many clan or family names, such as Katihawea [*sic*], Katiraka [*sic*] which the people who arrived from the 16th century onward, Ngatimamoe [*sic*] and Ngaitahu [*sic*], gave to all the people who had preceded them.' (Anderson 1985: 7–8)

2.1.2 Food resources

The colder climate of the South Island high country generally precluded the cultivation of the kumara, which Maori had brought with them from Polynesia. Consequently, land resources, generally known as 'mahika [according to the southern pronunciation] kai', and lake resources or 'kai moana' were gathered seasonally and traded between hapu and whanau. Fish, birds, plants and their fruits, stems and roots, and rats were harvested (Dacker 1994). For example, large quantities of kauru, made from the ti-kouka (cabbage tree) in large umu-ti (ovens), were processed at sites such as the Dart River Bridge in the high country and traded for titi (muttonbirds) from coastal areas (Dacker 1994).

When the Polynesians first arrived, parts of the South Island high country were inhabited by moa, flightless birds belonging to a group known as 'ratites'. These birds have a flat breastbone, and some have small wings. Both moa and kiwi belong to this group, as do emus in Australia, ostriches in Africa and rheas in South America (Anderson 1985).

2.1.3 Landscape change and fire

In addition to alpine and subalpine vegetation, the high country also supported forest, since most of the land below c. 900–1100 m was forest-covered. The only extensive grasslands below this height were in the dry basins of Central Otago and the Mackenzie Country. Parts of the Canterbury Plains may have been open kanuka country (Anderson 1985). Historical geographer K.B. Cumberland pointed out that 'vegetation developed in complete isolation, and in the absence of man and, equally significant, of all grazing and browsing mammals, except the moa' (Cumberland 1944: 152).

By the end of the pre-European period, fire had altered almost the entire South Island high country (Anderson 1985). Lightning strike and dryness had caused some fires in the southern New Zealand forests before the arrival of the Polynesians, and there is a band of lignites extending through Central Otago into northern Southland that supported natural fires for thousands of years. However, radiocarbon dating of charcoals,

fossil logs and the vegetation changes revealed through pollen preserved in peat swamps show that most deforestation happened from the 12th century onward and that most burning occurred between the 13th and 16th centuries (Anderson 1985). Maori oral tradition tells of Te Rapuwai and Waitaha starting the fires (Anderson 1985). Anderson concluded that pre-European Maori 'had been involved in the loss of 50% of both the primeval forest area and the late Holocene or postglacial suite of bird species' (Anderson 2002: 20). Botanist Alan Mark and others (Mark et al. 2003) noted that in the rainshadow region to the east of the Southern Alps, before the major influence of fire occurred during the period of Polynesian occupation, forest was widespread everywhere except for the driest parts of the intermontane valleys. By the time of European settlement (c. 1840), this region had become mainly indigenous tussock grassland (Mark et al. 2003).

The fires were much more devastating in the rainshadow region to the east of the Southern Alps than anywhere else in New Zealand. The dry climate and prevailing northwesterly winds during the summer meant that small fires could grow into large-scale conflagrations. Also, the rate of regeneration was slow. It could take 200 years for vigorous second-growth forest to become established in the south, compared with c. 50 years in the warmer and damper north (Anderson 1985).

Anderson (1985) believed that the early colonists maintained year-round settlements on the coast, preying continually on local moa populations, but that they probably hunted moa in the high country less often. Coastal moa populations probably became extinct by the late 14th century, and those in the high country by c. AD 1500. As the moa population waned, southern Maori began to abandon their ancestral high-country hunting grounds and to exploit more heavily the resources of the sea, coastal plains and hills (Anderson 1985).

In assessing modification of the New Zealand landscape by early Polynesians, Anderson observed that:

> 'The nature of the pre-European Maori environmental impact was, in its early stages, almost certainly one that is typical of colonisation everywhere and at all times. Migration into new environments releases a powerful instinct to expand as rapidly as possible, using the richest resources with pitiless energetic efficiency.' (Anderson 2002: 32)

The same would hold true for the next wave of colonists to arrive in New Zealand.

2.1.4 Stone resources

Barry Brailsford (1984) wrote that Maori discovered the toughest rock of all for tool-making along the coasts of Westland. They called it 'pounamu', and named the South Island after it. Next, the Maori explored the rivers to search for the source of the rock, which they found in the Arahura and Taramakau Rivers. He believed that 'the power and the beauty of pounamu drew the Maori into the alpine country' (Brailsford 1984: 1).

Although called 'pounamu' by Maori, in geological terms the stone is known as 'nephrite' or 'jade', and Pakeha call it 'greenstone'. 'To the Maori pounamu was the gift of the gods, a treasure of immense spiritual and material value', wrote Brailsford (1984: 1).

Nephrite is found only in the South Island of New Zealand. There are six main fields: Nelson, Westland, Jackson River on the southwest coast, Lake Wakatipu, Lake Wanaka and Milford Sound (Brailsford 1984). In their report on the Dart River Bridge site, upper Wakatipu region, Atholl Anderson and Neville Ritchie state that the remains at the Dart River appear to represent 'a small and probably temporary Archaic phase [roughly AD 1200–1500] settlement at which ti and moa cooking occurred and where, on a modest scale, there was manufacture of nephrite adzes and flake and blade implements of porcellanite and silcrete' (Anderson & Ritchie 1981: 9). The Dart River site (Fig. 1) was probably selected by Maori because it was adjacent to ti-kouka trees, moa, pounamu and other stones, river transport, and a steep, sheltering mountain slope.

Greenstone found at the head of Lake Wakatipu is often of the creamy grey-green inaka (or inanga) type, and Brailsford commented that the expeditions of the West Coast (Te Tai Poutini) Maori into the high country and to the Wakatipu Field suggest a social trade rather than a shortage of greenstone. Historical records since Captain James Cook visited New Zealand in the late 18th century reveal that the Wakatipu Field was important to Maori (Brailsford 1984). For example, in the 19th century, the artist and surveyor Charles Heaphy noticed that Arahura Maori sometimes went down the coast and across the alps to Lake Wakatipu (Brailsford 1984). Canon James West Stack recalled that in the late 19th century, Maori from the east coast of the South Island travelled through the high country and across passes to the West Coast in small parties during autumn (Stack 1935, cited in Brailsford 1984).

2.1.5 Trails and routes

Kai Tahu historian Te Maire Tau (2000) explained that mountains were places where people experienced a sense of clarity and purpose and were tapu (sacred). They were believed to be ancestors, and therefore allowed Maori, through their whakapapa, to claim kinship with the land. For example, he recorded that the 'Canterbury mountains such as Maungatere (Grey), Tawera (Oxford) and Kuratawhiti (Torlesse Range) were ancestors who came to New Zealand on the *Arai te Uru* canoe. After the canoe overturned in a storm, the crew struggled ashore and headed inland, and when the morning dawned they had turned to stone' (Tau 2000: 57). However, access to the mountains was not necessarily restricted, even though they were considered sacred. Kai Tahu gathered food from Mount Grey/Maukatere, fought nearby and performed a number of rituals there (Tau 2000).

Te Maire Tau also wrote that 'the tracing of whakapapa through features of the landscape may be seen in the example of Hine Paaka, a tree in the Springburn area [Alford Forest, in the Canterbury high country] made

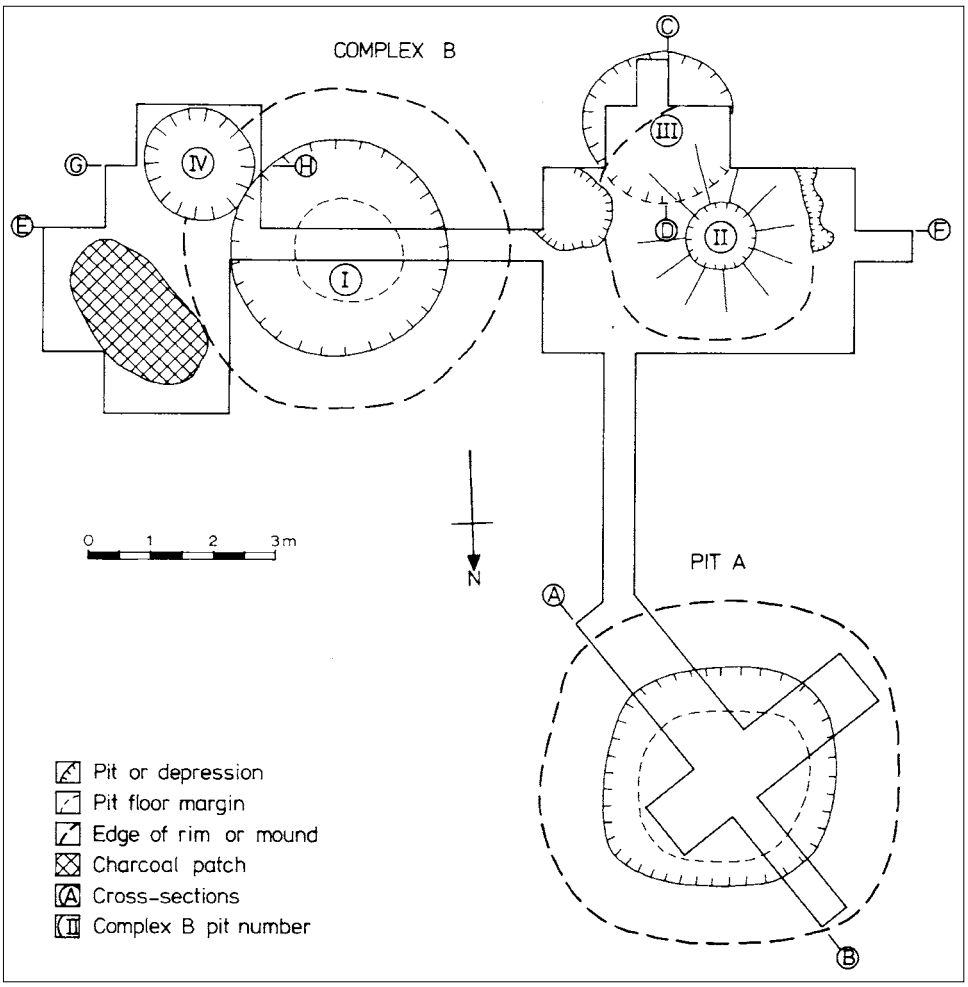

Figure 1A. Archaeological plan of umu-ti (ovens for baking the roots of cabbage trees) on the banks of the Dart River, about a day's travel from the greenstone sources. The excavation was carried out by Neville Ritchie and Atholl Anderson. The ovens have been radiocarbon dated to c. AD 1250–1350. From Anderson & Ritchie (1986). *Courtesy of New Zealand Journal of Archaeology*.

tapu by Turakautahi, the Ngai Tahu leader and founder of Kaiapoi Pa' (Tau 2000: 50). According to oral traditions, Hine Paaka, Turakautahi's aunt, owned the land from Tawera (Mount Oxford) to Te Umukaha (Te Muka). Her whakapapa stemmed from Kai Tuhaitara, the Kai Tahu hapu who took the Canterbury–Banks Peninsula area from Ngati Mamoe and Waitaha. She was also descended from Waitaha. Her ancestors once went up to Otarama (Kowai Bush) in the Canterbury high country to hunt pigeons, kaka and weka (Tau 2000).

Maori trails that traversed the South Island high country provided important economic and social links. The language is enriched by references to the huarahi, or ara—the trails—and the folklore of travel (Brailsford 1984). Mat Ellison, Pou Kura Taiao for DOC's Otago Conservancy office, explained, for example, that the natural bridge just north of Roaring Meg Creek in the Central Otago high country was called 'whata-to-rere' (meaning 'ladder-pull-fly'); the rocky outcrop in the Old Man Range now known as the 'Obelisk', a few miles to the southeast, was named 'kopu-wai' ('to swallow water') (M. Ellison, DOC, pers. comm. 17 July 2003).

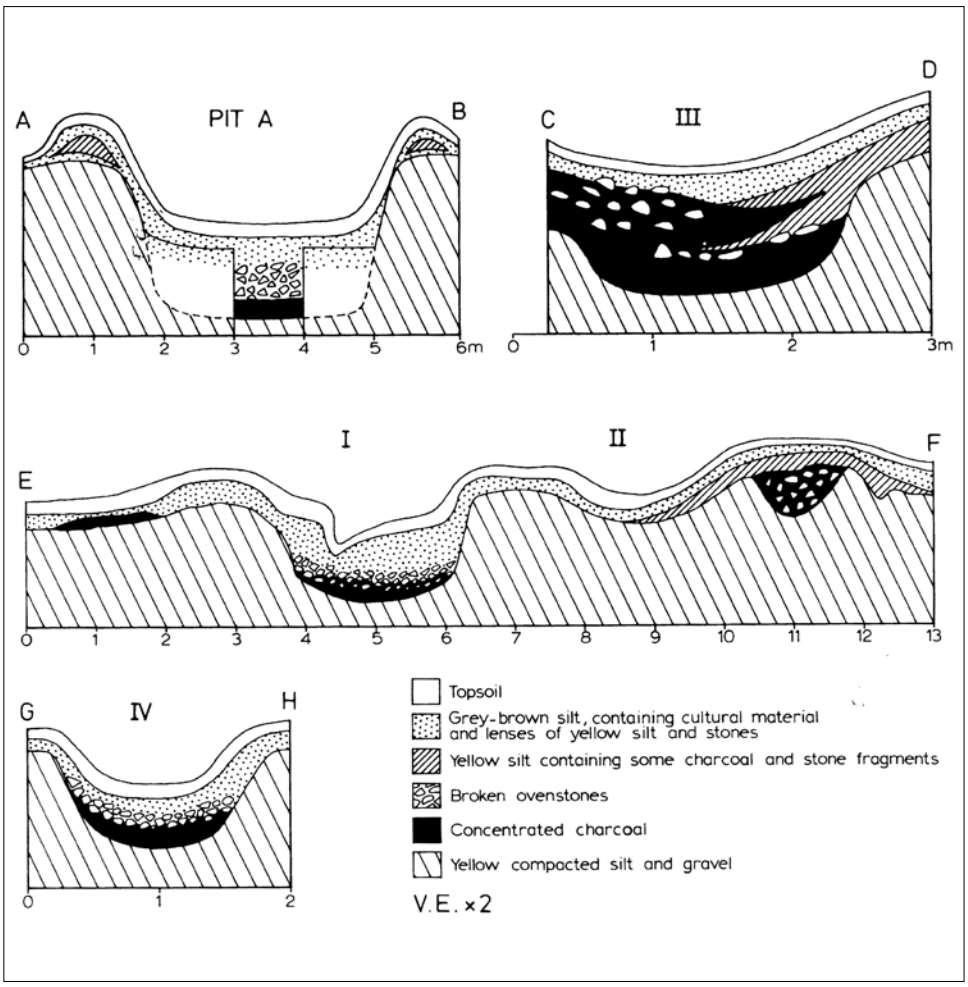

Figure 1B. Archaeological sections of the umu-ti shown in Fig. 1A. From Anderson & Ritchie (1986). *Courtesy of New Zealand Journal of Archaeology*.

In the South Island, there appear to have been few ridge trails but many valley trails to and through the high country. Bracken fern was difficult to traverse, and fire—which sometimes became uncontrollable—was used to open up such country. In swamp country, trails had to be built up with layers of bracken or manuka brush. Chasms were bridged with poles or crude vine suspension bridges. Ladders, vines and ropes were used to climb cliffs and bluffs. Wooden pegs were driven into steep faces to provide hand and footholds, and steps were dug into slopes. Dangerous rivers were negotiated by swimming, or floating with flax-stalk rafts shaped like bulky canoes, or by using breast poles. In the forests, small clearings with a view were preferred as resting places.

Trails through forest and scrub were broken by leaders who marked the route for others by snapping, but not breaking, small branches along the way. If later groups consolidated an earlier trail by snapping new growth, the route became clearly marked, especially because Maori travellers walked in single file, putting heavy pressure on a narrow path of land. Early European observers, such as the missionary William Colenso, noticed that where Maori trails traversed moss, the vegetation was crushed and never sprang back into shape (Brailsford 1984).

Maori had a detailed knowledge of the trails. Guides could recite in accurate sequence the place names of a complex river system. For example, Maori knew the Rakaia River well, and this is shown in the Maori place names recorded for key geographical features. Otago historian Herries Beattie stated that:

> 'The southern branch of the Rakaia was known to the Maori as Rakaia-wai-pakihi (Rakaia of the feeble flow), the middle branch or Mathias River as Ori-karoro (ori = bad weather; karoro = seagulls), and the northern branch or Wilberforce River as Rakaia-wai-ki (Rakaia of the full, strong flow).' (Beattie 1945, cited in Brailsford 1984: 123)

Brailsford (1984) added that 'Three passes led off from the three branches of the Rakaia. Each of these passes led from North Canterbury directly into the greenstone country and therefore was of value to Maori' (Brailsford 1984: 124).

2.1.6 Trade

According to Brailsford (1984), pounamu was central to the system of gift exchange. It is likely that whereas the first greenstone was transported up the coast by double-hulled canoe (waka unua), Poutini greenstone was taken over the alpine passes later, when the large colonising canoes that could handle the rough conditions of the western shore were no longer being built (Brailsford 1984). Greenstone was carried on the backs of male members of the tribe or slaves. The Kaiapoi or Kaiapohia Pa on the northern Canterbury coast became the pre-eminent centre of the pounamu trade north. Once taken to Golden Bay, the greenstone could be placed in canoes for the next stages of the journey to the north (Brailsford 1984). Figure 2 shows the greenstone trails of the South Island.

Essential provisions for alpine crossings were gathered at mountain lakes in the high country, and Maori moved in stages from lake to lake (Brailsford 1984). Eels, freshwater mussels, ducks and other birds such as pigeon or weka were caught. On the Mawhera–Moana alpine route, for instance, these stages appear to have been Lakes Moana (now Lake Brunner (Moana)), Poerua, Kaurapataka, Sumner, Katrine, Mason, Taylor and Sheppard (Brailsford 1984). At Lake Moana, Maori camped at Pah Point and on the Refuge Islands. Many acres of potatoes were cultivated there some time after their introduction by Europeans in the late 18th century. Greenstone flakes, heitiki and other Maori items have been found on the Refuge Islands. The Taramakau–Hurunui route from coast to coast, via Lake Moana, was about 350 km long and probably took between 15 and 20 days for family groups to complete (Brailsford 1984).

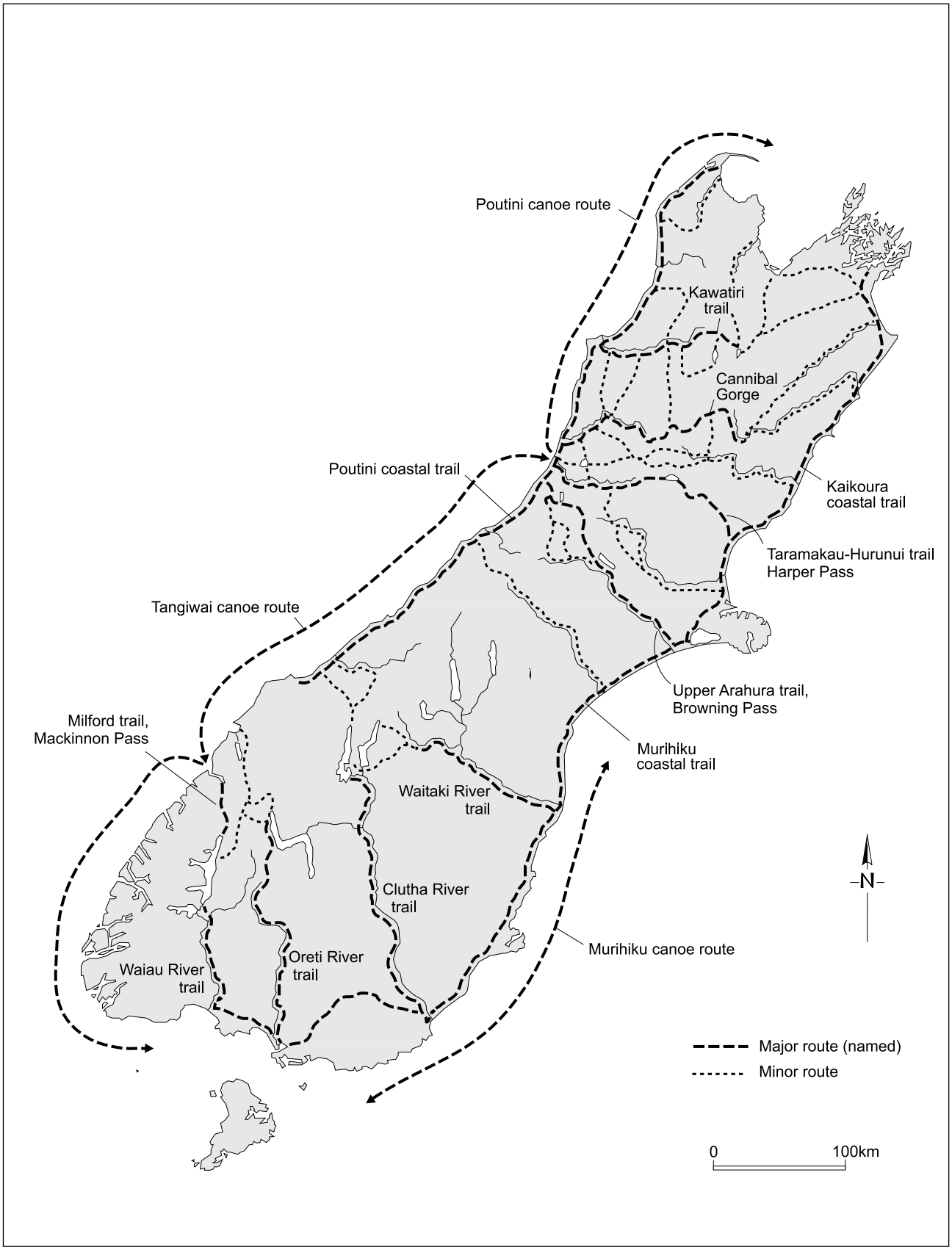

Figure 2. Greenstone trails of the South Island, after Brailsford (1984).

2.1.7 Domestic life

Maori were very skilled at building shelters. Captain James Cook observed the rapid construction of bush bivvies by visiting Maori in 1777 at Queen Charlotte Sound (Beaglehole 1967: 60, cited in Brailsford 1984). Alpine parties may have carried building staves with them. These staves could have doubled as walking sticks or as breast poles for crossing rivers, helping Maori keep their balance when they were weighed down with large loads of greenstone and food (Brailsford 1984).

Fire-lighting skills were also very important on alpine crossings. Edward L. Kehoe, a Westland expert on Maori life, described how fire was made:

> 'The seed of fire is forever in Kaikomako trees. Another fire child is the Mahoe tree sometimes known as whitywood, which is also common on the coast.
>
> 'Maoris got a flat piece of Kaikomako and with a pointed piece of Mahoe wore a groove in the Kaikomako. Working swiftly and hard, dust gathered in the groove and then they added dry cabbage leaves, ti-tree, and after a time a flame came.'
>
> (Kehoe, pers. comm. 1953 to Brailsford, cited in Brailsford 1984: 117)

As well as taking a fire plough (i.e. the stick of mahoe) and other materials to make fire for cooking and warmth, Maori often carried materials for a torch to light the darkness (Brailsford 1984). Fungus (also known as 'morepork bread') was dried and set alight from campfire embers, giving off a constant glow. Each piece could be used for many hours (Brailsford 1984).

2.2 PHYSICAL REMAINS

2.2.1 The early period: circa AD 1100–1350

Moa hunting

It is thought that by the 12th century there were already moa-hunting camps in the Waitaki Gorge, in particular at Woolshed Flat. Some studies of artefacts suggest that many moa-butchery sites were established between AD 1150 and 1300 (Anderson 1985). Settlement appears to have expanded most rapidly in the 13th century, when moa hunting was at its zenith at Hawksburn, the Dart River Bridge and Owen's Ferry, and also at various rock shelter sites in the Cromwell and Waitaki Gorges (Anderson 1985).

The smallest moa were 15–30 kg, and the largest 125–230 kg, making the biggest more than twice the weight of a large man (Anderson 1985). Most moa preferred to live in mixed shrubland and forest on the coast and in the high country. Eastern South Island moa bone deposits are found mainly in areas that were covered in forest until well into the early Maori era. This was the case even in dry districts such as Central Otago, where moa bone deposits and moa-hunting camps are focussed around the lower hill slopes, which were forest- and shrub-clad (Anderson 1985). The contents of moa gizzards that have been preserved

among the bones in swamps show that forest food, especially twigs and leaves from shrubs growing along forest edges, were desired items of diet (Anderson 1985).

Archaeologist Atholl Anderson (1985) believed that the most likely ways that moa were hunted was by being ambushed and killed with spears thrown from close range, or with traps and snares, or through being baled up by dogs. Biologists Trevor Worthy and Richard Holdaway contended that the killing was 'done by snares and by simply walking up to the birds and clubbing them … Large birds with necks outstretched forward as they moved through dense vegetation must have seemed pre-adapted to snaring' (Worthy & Holdaway 2002: 546). Very little evidence of traps and snares constructed for moa hunting has been found anywhere in New Zealand (Anderson 1985).

Early Maori killed moa in vast quantities: 100 000–500 000 during the early period according to Anderson (1985). While Worthy and Holdaway concluded that estimates of catch rates and archaeological evidence reveal that 'moa were rare or nonexistent in the diet of former moa hunters less than a century after human settlement began' (Worthy & Holdaway 2002: 546), Anderson stated that they were the staple of the South Canterbury and Otago Maori diet for 200–300 years, and were also eaten a great deal in Southland (Anderson 1985). By the early 1980s, over 120 moa-hunting sites were recorded for southern New Zealand, in three main areas: on the north Otago coast, on the Catlins coast and along the margins of the basins in the Mackenzie Country and Central Otago (Anderson 1985). It is in the Mackenzie Country and Central Otago districts that the nature of moa butchery and its associated artefacts can be seen. Anderson observed that 'Typically, interior butchery sites comprise rows of ovens situated along the banks of streams, with large quantities of bone, moa eggshell and artefacts scattered near and among them' (Anderson 1985: 11). The Hawksburn site is a case in point, where the remains of more than 400 moa have been found. Moa butchers used four key types of stone tools: small sharp knives for skinning, heavy cleavers for jointing, long saw-toothed knives for cutting flesh and sinew, and scrapers for many tasks such as removing fat from skins. Very few moa were brought to the camp intact. Usually, the head, neck and feet had already been discarded. Two-thirds of the birds also had the rib cage, breast (which on ratites has little meat) and backbone removed. Most moa were brought back to camp as leg joints (Anderson 1985).

Those few that were brought back whole had the head, neck and feet removed, and these bits were thrown onto the rubbish heap. Then the ribs, breastbones and vertebrae were thrown onto the butchery floor and the legs put in the ovens (Anderson 1985). After being cooked, the leg bones were smashed, possibly so that fat or marrow could be extracted to eat or to preserve flesh.

Sites at Nevis and Akatarewa (Waitaki Gorge) may have been up to five times as large as the one at Hawksburn, and around 2000 moa could have been butchered at each. Woolshed Flat, Puketoi and Millers Flat were about the same size as Hawksburn (Anderson 1985). Anderson

(1985) figured that they all probably operated as central bases from which hunters searched for their quarry in the surrounding high-country hills. Overnight shelter was usually provided by rocks, where campfire remains, fragments of moa bones and eggshells, or stone knives have been found (Anderson 1985). Shelter during longer hunting trips was provided by smaller but similar sites to the main bases. For example, Anderson noted that one of these, high on the plateau below the Garvie Mountains in northern Southland, contains the remains of two huts around which are scattered butchery tools and 34 piles of moa gizzard stones. There is almost no bone on this site and very little evidence of cooking (Anderson 1985). Hawksburn, most of the small rockshelter sites and other moa-hunting camps were occupied 600–800 years ago. Anderson observed that although earlier scholars argued that moa hunting began in the high country only when the coastal moa populations were becoming depleted, more recent findings show that early Maori foraged throughout the inland ranges from earliest times (Anderson 1985).

It is likely that Maori brought the many moa remains at the Waitaki River mouth from the foothills and high country on reed rafts (mohiki) (Anderson 1985). The journey from the gorge above Kurow could be completed in less than a day. Relatively long hours of sunshine and regular warm, dry winds suitable for preserving moa meat by drying gave the Waitaki River mouth and its associated inland sites an advantage (Anderson 1985). Sometimes the drying was preceded by smoking (Anderson 1985).

Stoneworking

Soon after settling in southern New Zealand, Maori searched for different types of stone that they could use for making implements and ornaments, regardless of how remote the sources were. Hard quartzitic rock known as ‘silcrete’ or ‘quartzite’ was used for making large cleavers and knives; porcellanite was used for smaller knives (Anderson 1985). These two types of rock were found mainly in the high country between the Mackenzie Country and northern Southland. Greenstone was mostly hammered and polished where it was found and made into weapons, tools and ornaments.

Rock drawings

The high country of southern New Zealand has remarkable sets of rock drawings, artefacts that are rare in the north. The sites are located in the limestone shelters of North Otago and the South Canterbury downlands. Others are at Weka Pass, Pyramid Valley and Kura Tawhiti (Castle Hill and Cave Stream) in Canterbury; in the Waitaki Gorge; in the Mackenzie Country; near Clifden in Southland; and west of Lake Te Anau (Anderson 1985; Ian Hill, DOC, pers. comm.).

Maori artists used mainly charcoal and red ochre, sometimes mixed with oil to make soft crayons. Mostly they drew people, birds and dogs. Moa were hardly ever drawn, although moa drawings have been found at Weka Pass and at Moa Valley in South Canterbury. There were some birdman

figures. Although meanings are obscure, the drawings give clues as to the way territory was carved up among different iwi. Those in various areas of Otago and Canterbury are stylistically distinct: in North Otago the birds are nearly all in natural forms, whereas in South Canterbury they are more stylised and mythical; North Otago has all the drawings of people shown in profile and the dogs are shown with rounded hindquarters, whereas most South Canterbury dogs have upraised tails. Anderson (1985) argued that although there may be some chronological variation shown in these stylistic differences, on the whole they indicate that the Waitaki River acted as a sort of cultural boundary.

Settlements

The population of southern New Zealand probably reached c. 3000 in the 13th century (Anderson 1985). A number of sites became permanent. These seem to have been sites where several hundred people lived during part of the year and 20–30 elderly or ill inhabitants remained at other times. Shag Mouth is a leading example.

Known village sites had three geographical features (Anderson 1985):

1. They were in districts where moa and seals were easily available
2. Inhabitants had access to high-country moa-hunting grounds, from which preserved meat was probably carried down rivers such as the Mataura, Clutha, Taieri and Waitaki, as well as along routes like Dansey Pass and Pigroot Creek
3. They had rocky shore and estuarine resources

At these southern latitudes before the arrival of Europeans, Maori lacked the economic security afforded by gardening, and consequently had to find food by hunting, fishing and gathering (Anderson 1985). The harvesting and preparation of food and other resources in the South Island were based at kaika nohoanga among the rivers, inland plains and lakes, some 96 km or more from the home settlement. These camps were generally deserted during winter, but in summer they were inhabited by eeling and birding parties (Evison 1993).

2.2.2 The middle period: circa AD 1350–1550

Settlements

By the late 14th century, the number of people in Maori settlements in southern New Zealand had begun to decline (Anderson 1985). Sites inhabited during the 14th to early 16th centuries were small and quite specialised (Anderson 1985). For example, Anderson found evidence of moa-hunting camps at Wyuna-Koch, Boltons Gully and Hampden, a fowling camp at Ototara, and a camp at the Dart River Bridge at which cabbage tree roots (ti) were cooked and greenstone worked (Anderson 1985).

Food resources

The decline in population can be linked to the decline in moa and seals (Anderson 1985). It is not clear exactly when moa became extinct. Hunting was probably a key reason for their decline and extinction (Anderson

1985). In addition, Maori collected moa eggs, and moa seem to have been very slow breeders, with only one or two eggs in each nest (Anderson 1985). Another contributing factor was the retreat of the forest, which meant reduced habitat for moa (Anderson 1985). Worthy & Holdaway (2002) contended that much of the natural vegetation of the South Island was probably destroyed by fires within the first century of settlement. They stated that radiocarbon dates for both coastal and inland sites 'all point to a brief, early period of firing' and that loss of habitat 'was a major additional cause of extinction of the large moa populations in the east and south of the South Island' (Worthy & Holdaway 2002: 546).

By the 15th century, offshore fishing provided by far the main source of food (Anderson 1985). Open country and coastal birds provided other sources of food for Maori there, and cabbage tree roots had become a staple of Maori diets by the European period (Anderson 1985). There are hundreds of umu-ti in southern New Zealand, mostly in the downlands of South Canterbury and North Otago (Anderson 1985). Umu-ti at the Dart River Bridge have been radiocarbon dated to AD 1227, 1363, 1508 and 1613 (Anderson 1985). Although ti-kouka cooking took place throughout the pre-European era, Maori probably became more reliant on it as other resources declined (Anderson 1985). Maori teeth showed an increased incidence of heavy use through the chewing of gritty and fibrous food from the late 15th century (Anderson 1985). Anderson (1985) suggested that a combination of fishing and ti-kouka gathering in Otago and South Canterbury, and of fishing and ti-kouka and fern root gathering in Southland, were the main food sources.

Material culture

The changing economy also affected the material culture (Anderson 1985). Now that moa were scarce, there was less reason to go inland to the high country. Consequently, the use of silcrete and porcellanite diminished, and the use of coastal materials such as chalcedonic and chert-like rocks increased (Anderson 1985). Also, because there were fewer seals and moa to butcher, there was a decline in the size of flake and blade butchery implements (Anderson 1985). Sharks' teeth and tusk shell were used for necklaces rather than bone reels (Anderson 1985).

Conflict became more frequent after the 1400s (Brailsford 1984). Brailsford (1984) suggested that increased geographical mobility prompted by declining food sources led to tribal fights as food-gathering areas overlapped. Greenstone that was obtained from specific locations in the high country and then precision cut gave Maori who possessed it a technological advantage. The finely crafted shapes of adzes, gouges, chisels and weapons were achieved with various grindstones (Brailsford 1984).

Brailsford (1984) contended that before AD 1400 or 1500, greenstone did not feature prominently in the Maori work kit, but after AD 1500 the cutting edge of the superior greenstone adzes was probably used to construct the high timbered palisades of Maori pa. When precision cutting was employed to make stone tools, they were manufactured in other territories, away from the stone deposits (Brailsford 1984). Brailsford

(1984) suggested that the development of a network of trails out of the greenstone country was possibly the key to this Maori technological revolution. He wrote that:

> 'After 1500 A.D. pounamu was the pivot of power in the land and a principal medium of exchange.
>
> 'Archaeological sites such as Murdering Beach [Whareakeake] in Otago and Pa Bay on Banks Peninsula were greenstone factory areas that were power bases built on the production of finished artefacts using pounamu obtained from Wakatipu and the Poutini Coast.'
>
> (Brailsford 1984: 30)

2.2.3 The late period: circa AD 1550–1800

Although most archaeological evidence from the late period, AD 1550–1800, is centred on the mid-Otago coast (Anderson 1985), there is also evidence of occupation of inland areas in the Manapouri–Te Anau District (rock shelters have been found on islands in Lake Te Anau) and the upper Wakatipu District, especially Glenorchy and Camp Hill (Anderson 1985). Artefacts have also been found at Strath Taieri and Maniototo (Anderson 1985).

Archaeological interpretation of sites is difficult and controversial, and becomes confused with traditional history, which records the arrival of the Kati Mamoe people towards the end of the 16th century, and that of the Kai Tahu c. 100 years later (Anderson 1985).

As for previous periods, the Maori had no metals and relied on stone for making adzes, chisels, saw-edges, and cutting and grinding implements. Kai Tahu historian Harry Evison (1993) noted that while the pounamu of Arahura was the best stone for strong and lasting adzes, pounamu tangiwai, whalebone and other bone were used for ornaments, fish-hooks, needles and weapons.

Historian James Cowan (James Cowan transcript, National Archives, cited in Brailsford 1984: 95) wrote that the hot mineral springs in the upper Maruia River valley, and the route over the Lewis Saddle to the Waiau River and into South Marlborough and North Canterbury, were used by swag-carrying parties of greenstone-fetchers and warriors. He argued that the wars for pounamu first made this trail known to other southern Maori and would lead to the subjugation of the original owners of Te Tai Poutini (the West Coast), Ngati Wairangi (James Cowan transcript, National Archives, cited in Brailsford 1984: 95). Kai Tahu were far too numerous and warlike for this small tribe. Soon after the wars broke out, other routes to the coast were discovered: one over the Hurunui Saddle and another across the downs and plains to Hanmer and over into the Maruia and on to the Mawhera (Grey) and Kawatiri (Buller) River valleys. Many relics have been found along the Maruia Valley: adzes and ear drops of greenstone, pieces of paua shell used in fish hooks, remains of eel baskets, and other items (Brailsford 1984).

Before the pounamu wars, greenstone pieces that had been worked into finished shape on the West Coast were often taken over the mountains

during summer to iwi in the east (Brailsford 1984). It is probable that parties of 6–12 Maori consisting of men, women, children and slaves made the trip. Two passes especially were preferred for these journeys: Okura in the south and Harper Pass at the headwaters of the Hurunui and Taramakau Rivers in the north (Brailsford 1984). Only those Maori who were physically powerful and agile attempted other routes such as Browning Pass/Noti Raureka and Arthur's Pass (later, war parties would travel swiftly through these hazardous routes to take Te Tai Poutini Maori by surprise). Family groups were loaded up with finished greenstone artefacts, unworked pieces and food. These were placed in flax kete and strapped to their backs in special packs (kauka). Maori made sandals of flax, ti-kouka or mountain grass; socks and leggings of tussock grass or native grass; rain capes of flax; and other garments of finely woven flax, paper mulberry or lace bark beaten into a cloth, or weka or moa skins. Extremely strong ropes were made from scraped flax that was then plaited (Brailsford 1984). Some of the foods taken were preserved: dried whitebait, eels, shark and prepared fern root; and birds were preserved in fat and carried in rimu or seaweed bags. The kuri (Maori dog) may have been taken across the mountains (Brailsford 1984). Canoes and mohiki were used for river transport.

Land tenure

By the 17th century, tribes were driving down from the north more frequently and settling in the south, placing increasing pressure on resources (Evison 1993). Pa were built at strategic points by some tribes for protection (Evison 1993). From the Kaikoura coast southward, much of the island now came under the control of chiefs of Kati Mamoe tribe from Ahuriri (Napier), who had vanquished Waitaha. Ngati Wairangi, the workers of pounamu, continued to occupy Te Tai Poutini (Evison 1993). Kai Tahu arrived in the late 17th century, having been pressured to migrate from the north by feuding with Ngati Ira and attracted by pounamu and other abundant South Island resources (Evison 1993). They shared a common ancestry with Ngati Porou and Ngati Kahungunu. First one section of Kai Tahu, called 'Ngati Kuri', had success in a number of conflicts with Kati Mamoe and eventually took control of the Kaikoura District (Evison 1993). Then other sections of Kai Tahu, including Kai Tuhaitara and Kai Te Ruahikihiki, went further south, taking control of the eastern South Island down to Waihora (Lake Ellesmere (Te Waihora)) and Tawera (Torlesse Range) (Evison 1993). To secure their possession, a pa was built at Kaiapoi, near the coast and the confluence of overland trails from the north, west and south. Later, a section of Kai Tuahuriri went through the high country to the West Coast, taking control of the pounamu resources there from Ngati Wairangi and becoming known as 'Poutini Kai Tahu' (Evison 1993). Kaiapoi then became a great pounamu trading centre.

By the 18th century, pounamu had become a major resource (Dacker 1994). Some hapu moved to the West Coast and trade routes developed

between east and west (Dacker 1994). The Waitaki River was a major trade route inland and to the West Coast (Dacker 1994).

Brailsford concluded that:

> '... as the onward rush of Pakeha technology replaced greenstone with iron, Maori knowledge of the pounamu trails was leached from tribal memory. However, there is sufficient evidence remaining to indicate that Maori understanding of the alpine passes of the South Island was remarkably comprehensive.' (Brailsford 1984: 180)

Although the population had declined when the moa became extinct, it rose again when the potato arrived with the Europeans in the late 18th century (Dacker 1994). The potato gave a great boost to South Island Maori since it could be grown in places where kumara could not. Cabbages, carrots, turnips and wheat obtained from Europeans were also cultivated (Evison 1993). Geographer Alex Wearing (1998) concluded, for instance, that by the time Europeans arrived in the Central Otago and Upper Waitaki River districts, Maori impact had become most evident on a few valley floors, riparian and wetland sites, and along the network of trails in the high country. He noted that wild potatoes discovered near Lake Wanaka in 1860 probably originated in former Maori gardens, and that 'Captain Cook's cabbage' grew luxuriantly on the more open spaces of the Cromwell Gorge and upper Clutha riverbed in 1872 (Wearing 1998: 184–185). Potatoes and fish were traded with Pakeha for spike nails, axes, knives and other iron and steel tools (Evison 1993), which were tougher and more durable than stone implements.

'Whanui' describes a closely related people, relatively few in number, who moved seasonally across a vast and geographically diverse area exploiting resources and competing for mana (prestige, power). Hapu would exploit mahika kai and kai moana to which they had established a proprietary right through their ancestors and continued working of the resource (Dacker 1994). This principle was known as 'ahi ka roa' (keeping the fires of occupation burning). Early Europeans noticed the seasonal movement of Maori about the South Island. Geographer Eric Pawson wrote that:

> 'The naturalist Walter Mantell observed how his guide Te Wharekorari could recite a long list of important sites, such as wetlands, up the Waitaki Valley. The surveyor John Barnicoat recorded that the Maori of Foveaux Strait "sometimes make excursions to the Snowy mountains and catch 300 woodhens per night". Ngai Tuahuriri went birding and trapping native rats in the ranges behind Kaiapoi, especially from April to July when prey had overfed on the tawai fruit. The rat was the most prized food, with rat runs being strictly controlled by family groups against poaching.' (Pawson 2002: 138)

The fighting season tended to be in late summer or early autumn between mahika kai rounds (Dacker 1994). Kai Tahu whanui were often moving about on a heke (migration) for mahika kai, kaihaukai (returning a present made by one tribe to another), pounamu or utu (revenge) (Dacker 1994). Mana was defended by attacking or migrating to avoid assault. Groups

on the move were frequently small and the distances covered great (Dacker 1994).

By 1830, intermarriage between the main streams of whakapapa meant that the hapu of Kai Tahu whanui had become closely related (Dacker 1994). The last of the fights between hapu around 1827 was known as 'Kai Huaka' (eat relation) feud (Dacker 1994). In 1829, an alliance of northern tribes struck the south (Dacker 1994). Led by Te Rauparaha of Ngati Toa, they attacked and overwhelmed Omihi on the Kaikoura coast. In 1831, Te Rauparaha also destroyed the two principal pa of Kaiapoi and Onawe. Kai Tahu's first signed land deal with Europeans in the south in 1832 (Dacker 1994)—an area of land between Dusky Sound and Preservation Inlet was sold to the whaler Peter Williams for 60 muskets—was probably driven by its need to acquire modern weapons. Te Rauparaha's return visits between 1836 and 1840 and measles epidemics in 1835 and 1838 left Kai Tahu in a weakened state (Dacker 1994).

In 1839, Te Rauparaha and Te Rangihaeata 'sold' huge chunks of the lower North Island and upper South Island to the New Zealand Company and claimed the right by conquest to sell the South Island down to Kaiapoi (Dacker 1994). Around 1843, peace was restored and slaves who had been taken by both sides were returned (Dacker 1994). Christianity was said to have played a part in resolving the conflict (Dacker 1994).

In 1891, Judge Alexander Mackay, Commissioner on 'Middle Island Native Land Purchases', reported that:

> 'The settlement of the country by the Europeans in the early days was looked on with considerable satisfaction by the Natives in the South Island, as it relieved them from the constant dread of hostile attack from the northern Natives; but long experience has proved to them that the colonization of the country is not an unmixed blessing, as it has deprived them of all their privileges and forced them to adopt a mode of life unsuited to their former habits, and under circumstances that keep them in a chronic state of poverty. Formerly they could obtain readily all the food and clothing they required; now they are obliged on scanty means to eke out a precarious livelihood; while the Europeans, who have possessed themselves of the territory that was once theirs, are living in affluent circumstances as compared with themselves.' (Mackay 1891: 5)

2.3 SUMMARY

2.3.1 General historical features

Before the arrival of Polynesians:

- Luxuriant forests covered much of the South Island
- Extensive grasslands were found only in the dry basins of Central Otago and the Mackenzie Country
- Parts of the Canterbury Plains were likely to have been open kanuka country
- Moa were plentiful
- Grazing and browsing animals, except for moa, were absent
- A band of lignites extending from Central Otago into northern Southland supported natural fires for thousands of years

After Polynesians arrived:

- Forests were fired
- Almost the entire high country was transformed into tussock grasslands and dry scrub
- Most deforestation is thought to have occurred from the 12th century onward, and most burning between the 13th and 16th centuries
- Fires on the eastern side of the South Island were more devastating than on the west
- Moa were hunted
- As the forests and the moa disappeared, southern Maori departed from their ancestral inland hunting grounds and exploited the sea, coastal plains and hills more intensively
- In the interior, rock deposits for tool making were discovered—of silcrete, quartzite, porcellanite, basalt and argillite
- Pounamu (nephrite or greenstone) was found at Nelson, the West Coast, Lake Wakatipu, Lake Wanaka and Milford Sound
- Greenstone was carried across high-country passes from the west and south to the east and north of the South Island
- Villages were unfortified until around the 15th century, but as conflict became more frequent, Maori pa (fortified villages) began to appear
- Precision-cut weapons and tools were made from highly prized greenstone

After Europeans began to arrive in the late 18th century:

- Grazing and browsing animals were introduced
- Pigs, potatoes and wheat were produced by Maori for the European market, as well as melons, cabbages and other European vegetables
- Much Maori land was alienated
- Reserves for Maori were established
- Mahika (or mahinga) kai (places where food was gathered or produced) and kaika (or kainga) nohoanga (permanent or seasonal camps) diminished in scale, production and use

- Maori worked seasonally for European landholders
- Some Maori built European-style houses

2.3.2 Key physical resources

- Landscape features of significance to early Maori
- Shell heaps
- Drawings in rock shelters
- Rock shelters with moa bone and shell fragments, and stone knives
- Burnt logs
- Moa bone deposits
- Greenstone trails: heavy pressure on narrow paths of land and many valley trails; steps in slopes; wooden pegs in steep bluffs, and staves for walking and crossing rivers
- Fire ploughs
- Moa-hunting/moa-butchery camps
- Interior moa-butchery sites: rows of ovens situated along the banks of streams with large amounts of bone, moa eggshell and artefacts scattered nearby; examples are Hawksburn, Nevis, Woolshed Flat, Puketoi and Millers Flat
- Stone blade-making quarries
- Stone tools
- Remains of huts
- Fish hooks
- Rock deposits for tool making
- Stone (including greenstone) and bone implements and ornaments (almost none of wood or fibre have survived in the South Island from *in situ* sites)
- Mahika kai and kaika nohoanga sites
- Umu-ti (ovens for cooking cabbage tree roots); for example, at the Dart River Bridge
- Kaika (village) sites
- Pa sites
- Greenstone factories
- Urupa (burial places)
- Waahi tapu

3. 1840s–1870s: Extraction and exploitation

3.1 LANDSCAPE MODIFICATION

3.1.1 Pastoral farming

Historical geographer Kenneth Cumberland wrote that:

> 'The period of European-New Zealand contacts before 1840 was one of crude, destructive exploitation. Except for the activities of explorers and missionaries, it was a period of wasteful destruction of animal and plant life at the hands of sealers, whalers, and timber exporters and of the partial overthrow of the old-time Maori culture and economy. Yet it involved little use or misuse of the soil.' (Cumberland 1944: 156)

At first, existing indigenous grasslands were used for grazing, and pastoralism took off in the 1840s in Nelson, Canterbury and Otago. Grazing expanded rapidly during the 1850s and 1860s, with the frontier advancing westward into the South Island high country (Hargreaves 1966).

New Zealand's key exports at this time were mainly wool, but also included skins and hides, leather and pelts, tallow, non-perishable by-products, potted and salt meat, and livestock (Grey 1994). Hardly any processing was done in the colony. Most of the wool went to mills in Great Britain (Grey 1994).

Historian R.P. Hargreaves wrote that the graziers imported merinos from Australia because they were cheap and easy to obtain (Hargreaves 1966). However, Canterbury historian Robert Peden (2002: 39) disputed the commonly held view that 'Canterbury's pastoralists were simply receivers of Australian technology and techniques'. He stated that:

> 'Canterbury imported sheep from Australia in two main bursts: in 1851 and early 1852, and then in 1861 and 1862 when over 55,000 sheep were shipped across the Tasman. Between these two major periods of importation the demand for meat from the goldfields made Australian sheep too expensive for Canterbury pastoralists, who had to rely on sheep from Nelson and, to a lesser extent, the Wairarapa and Otago to build their flocks.' (Peden 2002: 45)

In March 1852, E.J. Lee and Edward Jollie drove 1800 sheep through a pass in the high country from Nelson to Canterbury (Peden 2002). Within 12 months, c. 5000 sheep and 400 cattle had travelled from the Wairau and Nelson to Canterbury, and in 1854, flocks of 4000 sheep went through (McCaskill 1970). During the 1857–58 season, c. 24 000 sheep were droved south from Nelson (DOC 2005). Figure 3 shows Saxton Pass, an important 19th century route from the Awatere to the Acheron River catchment. Large numbers of sheep were again shipped from Australia in 1861, when demand for stock slumped, and in 1862, when drought in New South Wales and Queensland led to a drop in local stock prices (Peden 2002).

Figure 3. Aerial oblique of Saxton Pass (far right), an important 19th century route from the Awatere to the Acheron River catchment. View to the east. *Photo courtesy of Kevin L. Jones, DOC.*

Merinos were best suited to the drier tussock lands of Central Otago and the upper Waitaki River regions. By contrast, on the plains and downlands, the expanding demand from English manufacturers for long-combing wools, together with the knowledge that crossbreds provided better quality meat for preserving, soon encouraged a move away from merinos (Hargreaves 1966). There, English grasses were introduced in order for crossbreds to prosper, and throughout the period, until the 1880s, stud sheep of several types—Negretti, Gilbert Rambouillet, Saxony and Californian—were imported from around the world (Hargreaves 1966). By the mid-1860s, the Lincoln, Leicester, Cotswold, Romney Marsh, Cheviot, Southdown and Shropshire Down breeds of long-wooled sheep had probably been introduced into New Zealand (Hargreaves 1966). During this period, James Little, a shepherd working on the Corriedale Run, North Otago, bred the colony's own Corriedale—primarily a cross between the merino and the Lincoln, but with some English and Border Leicester as well (Hargreaves 1966). Peden observed that while the Corriedale became the predominant sheep on the plains and downlands of Canterbury for the next century, the merino 'was pushed back to the hard hill and high country' (Peden 2002: 58–59).

The largest pastoral runs were on tussock grasslands and many were situated in or near accessible major river valleys (Grey 1994). A typical sheep run was c. 4 square miles (1040 ha) of tussock land, mostly leased from the Crown (Grey 1994). Figure 4 shows the uptake of sheep and cattle stations in the Canterbury region. Historian W.J. Gardner described the Amuri Plains as they probably looked when the colonists arrived: 'the great bare landscape, the wide vista of clean hills, a tawny-coloured monotony of tussock, varied here and there by manuka and Wild Irishman' (Gardner 1956: 79). Although in some areas tussock was ploughed and sowed with English grasses, European settlers frequently continued and hastened the process of burning off (see section 3.1.2) that was

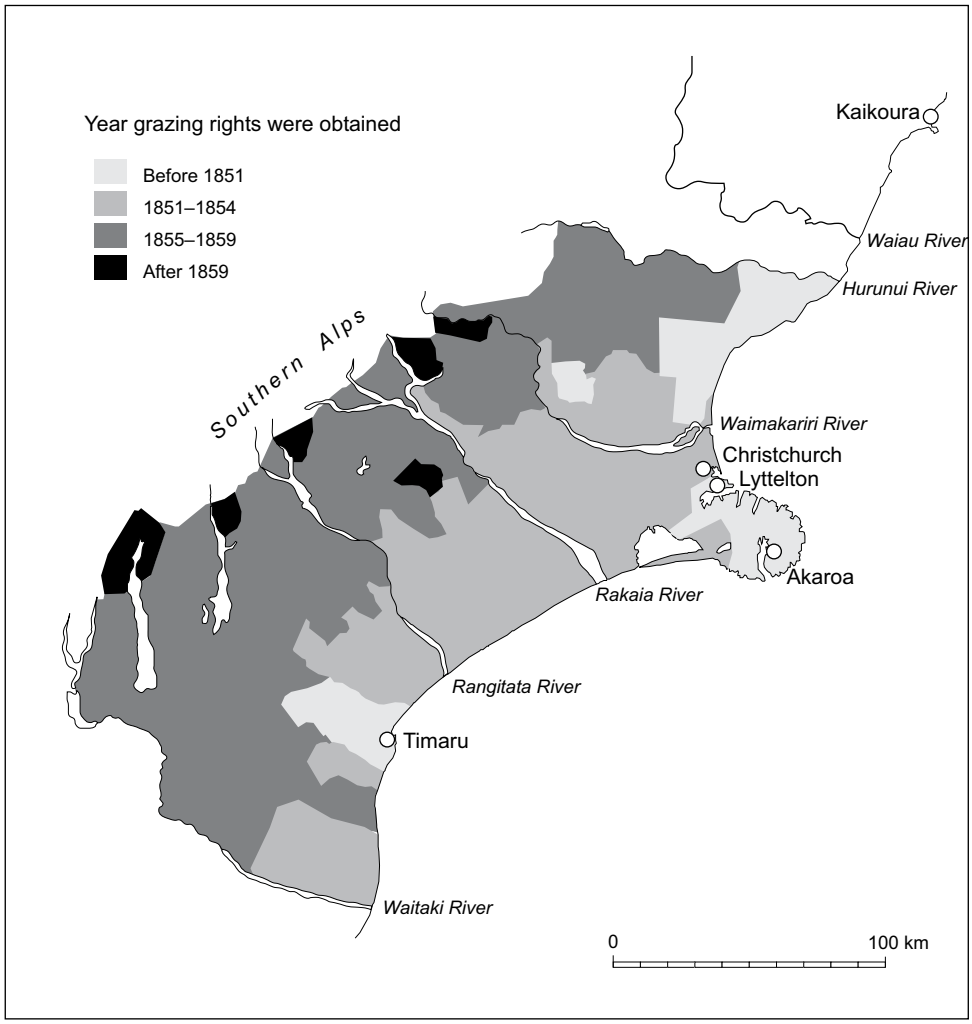

Figure 4. The uptake of sheep and cattle stations in the Canterbury region, after Cant & Kirkpatrick (2001).

begun by Polynesians centuries before. Cumberland noted that 'Early destruction or modification of vegetation brought the first large scale, indirect cultural interference with the structure and stability of soil' (Cumberland 1944: 158).

3.1.2 Burning off

'Crab-holes' or 'podge-holes' formed when large snowgrass tussocks burnt out (Beattie 1947). Burning was usually done in the spring and a third of the run was burnt each year. The writer and Canterbury high-country pastoralist Samuel Butler wrote that burnt feed meant satisfied and well-nourished sheep, and that the green, succulent grass that grew after burning was much better for sheep than the coarse, dry growth of summer that had been withered by the frosts of winter (Hargreaves 1966). The rough grass and shrubs of the high country gradually disappeared—but so did native birds and vegetation (Hargreaves 1966). On the Glens of Tekoa Station, Amuri, in February 1863, a great fire blazed across the run for 9 days (Gardner 1956). Bush and post-and-rail fencing on the hills burnt out. On the ninth day, as station hands frantically fought fire in the homestead paddock, rain quenched the flames just before they

reached the house. The following year, work started on a new homestead constructed with bricks made on the station (Gardner 1956).

Flooding became more prevalent as forests were felled. Burning off, trampling by stock and drying ground increased erosion in the high country and downstream on the hills and lowlands. Historian R.M. Burdon described Canterbury in the wake of the great flood of February 1868:

> 'The damage to property was enormous; and when the flood abated a desolate picture met the eye – houses levelled with the ground, crops silted over and buried, fences washed away, and the carcases of drowned sheep and cattle strewn in every direction. The face of the mountains was seamed with great scars that took many years to heal.' (Burdon 1938: 99)

In eastern Marlborough at that time, the Clarence River rose 10 m higher than any previously known level, spread over the valley floor and swept hundreds of acres of land out to sea (Sherrard 1966). Settlers usually responded by building stopbanks; the possibility that land-use practices may have contributed to the disaster seemed not to be considered (Roche 1994). Engineering solutions would continue to be the main local and governmental tactic until well into the 20th century (Roche 1994).

Settlers discovered that, with the exception of new leaves and flowering shoots, the tall tussocks of the high country and elsewhere were generally unpalatable to sheep and cattle (Holland et al. 2002). In fact, until the harder tussock was burnt off, only cattle could feed. Consequently, settlers burnt tussock continually to encourage the growth of new shoots (Holland et al. 2002).

Cattle were more suited to wet, swampy or bush lands than to the light, dry soils of Central Otago, but many runs were stocked with cattle first (Beattie 1947). When the ground became firmer and drier, the runholders changed their stock to sheep (Beattie 1947). By putting sheep on recently burnt tall tussock, pastoralists induced short tussock grassland (Holland et al. 2002). Fine native grasses declined as tussock grassland regenerated after burning, and less palatable plants, such as speargrass, maori onion, kanuka, cotton plant and silver tussock, thrived instead (Holland et al. 2002). Because prickly matagouri and spaniard could make the land impassable to stock, especially in drier places where these plants flourished, they were also burnt to clear tracks (McAloon 2002). As the nutritional value and productivity of pastures in the high country declined, runholders repeatedly burnt their land, causing further loss of soil and decline in fertility through smoke, erosion and blown dust (Holland et al. 2002).

Predictions of grassland deterioration were few and usually ignored. In 1864, draughtsman, botanist and artist J. Buchanan warned that:

> 'Nothing can show greater ignorance of grass conservation than the repeated burning of the pasture in arid districts which is so frequently practised. The first species of grass having fine fibrous roots ramifying near the surface are either destroyed by fire or afterwards by sun and frost, while the coarser tussock grasses, spear grass (*Aciphylla*) and

> many plants worthless as pasture, having large succulent roots, strike deep in the soil and are preserved. Much of the grassland of Otago has been thus deteriorated since its occupation, by fire, and it is no wonder that many of the runs require eight acres to feed a sheep according to the official estimate.' (Buchanan 1868: 181)

In 1868, the explorer and naturalist W.T.L. Travers (1868, cited in Holland et al. 2002) noticed that pastoralism in Nelson, Marlborough and Canterbury was affecting the environment adversely.

3.1.3 Advance of European settlement and retreat of mahika kai

In Otago by late 1858, all the best available runs had been claimed right up the Waitaki River, and in the Maniototo, Manuherikia, Lindis and Wanaka Districts (Pinney 1981). By the early 1860s, the 'front country' of the Amuri District, including the Hanmer Plain, was all being farmed, but the high country to the west was not yet fully occupied (Gardner 1956). Everything changed rapidly when the gold rush occurred across the mountains in 1864–65. Enterprising men who had an eye to new markets invested capital in the Amuri District high-country runs (Gardner 1956).

By the 1860s, on the eastern side of the South Island, Maori still relied on the traditional use of mahika kai, including that in the high country, for protein foods, especially eels, weka and waterfowl (Evison 1993). As European settlement advanced, their mahika kai disappeared. When grasslands, shrublands and forests were burnt to create pasture, wildlife habitats were destroyed (Evison 1993). Fences and the law of trespass often stopped Maori from getting to mahika kai that still existed (Evison 1993). Acclimatisation societies were formed to import game birds and animals, and to stock rivers with Northern Hemisphere fish for angling (Evison 1993).

By 1870, the plains, hills and mountains of the South Island had been transformed. Many of the former hunting and food gathering places of Maori were now the sheep stations of Pakeha (Evison 1993). Some high-country runholder residences were built in sheltered places where the old kaika nohoanga of the Maori used to be (Evison 1993), and mostly the lands were in the hands of relatively few men. For example, Robert Campbell was a partner in Galloway Run in Central Otago, and also owned Benmore and Otekaike Stations in North Otago, together with several runs in South Canterbury and Southland. In 1879, both he and Native Minister John Sheehan were responsible for the expulsion of Kai Tahu leader, tohunga and prophet Hipa Te Maiharoa and his people from land at Te Ao Marama (the world of light) near Benmore and Otekaike Stations, and Omarama. Te Maiharoa and his followers were forced to leave the upper Waitaki and to return to the coast (Mikaere 1998).

Throughout New Zealand, before fertilisers were used generally, production could be increased only through the expansion of the area farmed. Stock increased until the late 1870s as the total area under grazing increased, but once the supply of new land was exhausted, stock numbers declined in the drier parts of the country (Holland et al. 2002). Runholders began

to realise that this exploitative type of grazing was not sustainable (Holland et al. 2002). Overstocking and burning off reduced fertility to the extent that if it continued certain areas of Otago and other high-country districts would be damaged irreparably (Nightingale 1992).

3.1.4 Pests

Introduced animals that became feral caused problems. Pigs rapidly spread into the high country after their introduction by Europeans in the 1770s (McAloon 2002). They dug up roots of speargrass and tussock, and pitted the pasture. By the 1860s, when Bishop Hobhouse rode across Greenhills Station, he found that ground that should have been good for cantering had been 'honeycombed' by wild pigs (Hobhouse 1863, cited in Sherrard 1966). Wild dogs (imported animals crossed with the Maori kuri) preyed on sheep (McAloon 2002). In August 1860 at St Leonards, Amuri, 28 dead sheep were found in a small creek after being herded and caused to be smothered by these dogs (Gardner 1956). In response, sometimes sheep were guarded or enclosed at night, and men were employed to catch the stray dogs in the high country and elsewhere.

The greatest damage to high-country grasslands was wreaked by rabbits after their introduction (Gardner 1956). Runholders imported common brown, silver grey, bluish grey or large black rabbits, and established warrens for shooting parties with their friends (Gardner 1956) (Fig. 5). Silver grey furs were prized by English merchants, and runholders used small presses for bundling the pelts, which were packed in zinc-lined cases for export to London (Gardner 1956). Soon after they took up their run in 1859, the Keene family were probably the first to introduce rabbits in Kaikoura, at Swyncombe Station in the 1860s (Sherrard 1966). According to local lore, on Swyncombe at the top of a small hill, a clump of blue gums—which can be seen from the Inland Kaikoura Road—marks the spot where Captain George Ruck Keene let loose several pairs of silver grey rabbits (Sherrard 1966). In April 1869, Governor George Bowen asked the Keenes for a supply of silver grey rabbits to serve up to Prince Alfred, who was touring New Zealand (Sherrard 1966). In the 6 months leading up to October 1869, 10 000 rabbits were trapped at Swyncombe (Sherrard 1966). Despite the huge number removed, the rabbits depleted the pasture and eroded the hillsides, and in 1882 the Keenes were forced to walk off the property (Sherrard 1966).

3.1.5 Animal diseases

Kaikoura historian J.M. Sherrard (1966) wrote that in the early years of European settlement, animal imports were virtually uncontrolled and scab soon became rife. This disease was caused by ticks irritating the skins of sheep, which then tugged out their own wool, exposing flesh covered by a greenish scab. Although the Sheep Ordinance 1849 was introduced to eliminate scab by stipulating the inspection of flocks for infestation (McLintock 1966), the legislation was unlikely to work while flocks were able to intermingle (Sherrard 1966). Effective control could be achieved only after flocks were fenced. Moreover, there were no penalties for owning scabby sheep (Sherrard 1966).

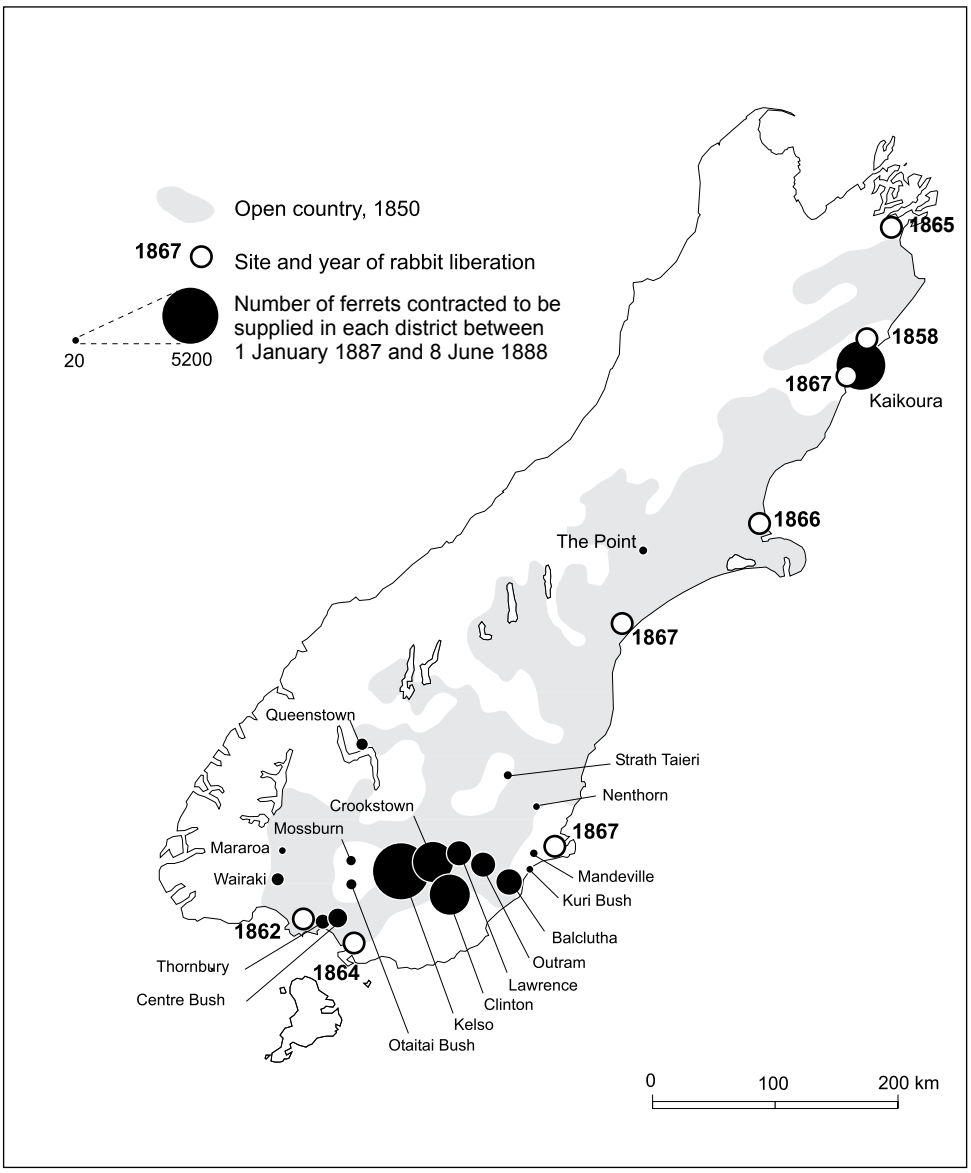

Figure 5. The liberation of rabbits in the South Island, after Pawson & Brooking (Eds) (2002).

Cattle infected with pleuro-pneumonia may have come from Australia in the early colonial period (Hargreaves 1966), and this disease was even more infectious to cattle than scab was to sheep (Hargreaves 1966). The Diseased Cattle Act 1861 attempted to prevent these animals from being imported from Great Britain and Australia. According to the Act, cattle believed to be infected were slaughtered, and the embargo remained in force until the late 1860s, when all provinces were declared clean (Hargreaves 1966). The Government had no other powers to control the general importation of alien species until the Animals Protection Amendment Act, 1895, clause (2) was passed (McDowall 1994). In fact, the earliest statutes were designed to encourage the formation of acclimatisation societies and to protect the species that they introduced, such as hare, swan, partridge, English plover, rook, starling, thrush and blackbird. Native species were not mentioned (McDowall 1994).

3.1.6 Acclimatisation of animal and plant species

Most introduced plants, birds, fish and mammals were from Europe (Sherrard 1966). For example, in 1873 G.F. Bullen successfully liberated ferrets to prey on rabbits at Kaikoura (Sherrard 1966). Thousands of ferrets were released on Greenhills, Waipapa, Kincaid and the Clarence Runs (Sherrard 1966) (Fig. 5). J.W. Trolove let out hundreds of cats bred on the Shades Station as rabbit destroyers (Sherrard 1966). By contrast, in the 1870s at Benmore Station, in the high country of northern Otago, rabbits were not yet considered to be a threat—wekas and a couple of men with guns and dogs kept their numbers down (Pinney 1981).

Plant nurseries were also responsible for introducing exotic species, which altered ecosystems (or habitats) and threatened the indigenous communities (McKinnon 1997). Attempts at sowing introduced grasses and clovers led to further environmental change. Many tall tussock grasslands had already been transformed into short tussock grasslands by burning and grazing in the alpine and lower subalpine zones (Holland et al. 2002). This exposed indigenous species to competition by invading grasses and weeds from Australia, California and Europe (Holland et al. 2002). In the South Island, although sown grass acreages were concentrated along the east coast from northern Canterbury to Southland, throughout the alpine zone of the high country—particularly in the drier parts—native grassland ecosystems were transformed irrevocably by exotic flora tolerant of rabbit browsing, sheep and cattle grazing, and low soil fertility (Holland et al. 2002). At St Leonards, Amuri, in the 1870s, seeds such as cocksfoot, crested dogstail and pine from San Francisco were planted (Gardner 1992).

Like other settlers, those of the high country attempted to tame and domesticate the wild colonial landscape surrounding their homesteads by planting trees, shrubs, herbs and lawn grasses that reminded them of 'Home' (Holland et al. 2002). Some of these introduced species became pests. For example, Nugent Wade, the manager of a northern Otago station, wrote to the owner, W.H. Teschemaker, in 1876 telling him that 'I found sweet briar growing very freely as a weed over the flat at Otematata, gradually spreading about everywhere … [it] would have assumed great proportions on our soil in a few years, being carried about by rabbits and birds, etc' (Holland et al. 2002: 76).

3.1.7 Weather

Although the years 1857–68 were considered to be 'the great age of Canterbury pastoralism' (Grey 1994: 207), Canterbury historian W.H. Scotter (1971: 179) wrote that 'Success depended on a heavy outlay of capital and a continuation of good conditions but, after 1864, troubles accumulated. Scab spread among the flocks and costly treatment was required. Large numbers of sheep were lost during the snowstorms of 1862 and 1867'.

In Canterbury, these storms were especially severe. The Kennaway brothers were forced to sell Clayton Station (behind Mount Peel) in 1862, and then in 1867 the new runholder, G.A.E. Ross, was ruined (Scotter 1971). Lady Barker wrote that during the 1867 storm, snow fell for 90 hours (Barker 1956). On her family's run the sheep were forced down to the flat near the homestead by an icy wind, but as the snow melted more sheep were drowned in the creeks than had been frozen. She described the scene afterwards:

> 'Even the first glance showed us that, as soon as we got near the spot we had observed, we were walking on frozen sheep embedded in the snow one over the other; but at all events their misery had been over some time. It was more horrible to see the drowning, or just drowned, huddled-up "mob".' (Barker 1956: 168)

Barker and her husband lost 4000 of their 7000 sheep during this storm (Hankin 1990).

In Amuri, the 1867 snow storm was the worst ever experienced by runholders (Gardner 1956). About 3½ feet (c. 1 m) of snow lay over the entire district for about a month. The partners on the St James Station, James Jones and the brothers Thomas and Edward Pavitt, were hard hit, and by 1869 they were bankrupt. Gardner commented: 'St. James as a sheep station was one to break the stoutest hearts and the most secure reputation' (Gardner 1956: 150–151). John Tinline of Tarndale lost 4000 of his 30 000 sheep and John Murphy lost 100 cattle on Molesworth Station, where the snow varied in depth from 5 to 25 feet (c. 1.5–7.5 m) (Gardner 1956). F.C. Tabart of Highfield Station lost 3300 dry sheep out of 9100 (Gardner 1956).

3.1.8 Mustering

As more and more high-country runs were taken up, tension grew between runholders over straying stock, especially where scabby sheep were involved (Hargreaves 1965). Managing a complete muster on rough terrain or in extensive high country was virtually impossible, and just a few sheep that had escaped dressing or dipping could reinfect an entire flock (Hargreaves 1965). Rivers acted as boundaries in some instances, but no run was properly bounded on all sides. Smaller runholders could not afford to build sheep dips to treat scab, and their flocks were often a menace to their neighbours. The altitude and craggy nature of the high country, fog and snow made mustering difficult. The average time leaseholders spent on the runs was 3 or 4 years of 'bitter struggle and blighted hopes. Most runholders were soon ruined by snow, scab, depression, or the failure of the West Coast market ... Even for one winter it was a life of isolation, cold, discomfort and real danger' (Gardner 1992: 147–148).

3.2 PHYSICAL REMAINS

3.2.1 Station construction

Early European settlers, like the Maori before them, often built their homes in sheltered places near streams, in hollows or in the lee of hills for protection from extreme heat, cold or wind. Pragmatic considerations such as proximity to water, firewood and building materials were also important (Dominy 2001). High-country homes were built from materials brought in, such as canvas, or from resources close to hand, often stone, clay, earth, trees or tussock (Beattie 1947). Walls of wattle-and-daub, snowgrass tussock thatch, beech, treefern and pit-sawn timber, putty made from moss, and mud floors with rushes were variously used in their construction (Beattie 1947). St Leonards Station, Amuri, had a cob cottage with tiny rooms and a great pile of peat outside for fuel (Gardner 1956). In the 1850s, some sort of improvised building construction was happening there all the time. Since there were no trees, rafters and palings for the men's house were brought in from Pahau bush in the station dray. Thatch grass was cut for the roof (Gardner 1956). At Otematata Station on the upper Waitaki River, timber that had been cut from the bush near Lake Ohau and rafted downstream was used for station construction (Pinney 1981).

In 1856, the politician Henry Sewell noticed that on pastoral runs, housing lagged behind because fencing was given priority (Scotter 1971). Fences reduced the need for shepherding, arrested the spread of disease and allowed runholders to exercise their pre-emptive (prior purchasing) rights. Sewell described the typical contemporary homestead on the Canterbury Plains, which doubtless was similar to many high-country homesteads:

> 'A Station house is a very rude affair. Every man his own builder, is the rule for Station buildings. You cannot get Carpenters, so people learn to put up the best sort of Sheds they can. Wooden slabs and clay—Toi toi grass for thatch are the materials. The result is a second rate kind of Farm outhouse, partitioned off it may be into two apartments; one serving for a sleeping room for the Master and Mistress, the other for all other purposes, including dormitory for an unlimited number of guests. The floors of course are clayed; a broken chair or stool, a chest of drawers, and a rough sort of Table form the furniture. From the roof hang joints of meat, harness and saddlery, (and other things suspendible) ... These Station houses stand solitary and desolate in the midst of a huge wilderness of plain, not a tree or a hillock to relieve them—nothing except the Ti palm ...' (McIntyre 1980: 208–209)

Figures 6 and 7 show cottages built at Mesopotamia Station in the early 1860s.

In the 1850s and 1860s, sheep runs usually consisted of several thousand acres of tussock grassland, mostly leased from the Crown. For example, at Coal Creek (by 1870 renamed Shag Valley) Station in Otago, Johnny Jones was allotted Crown grants for freehold land of around 11 000 acres (4455 ha) as legal compensation for land he had bought from Maori (Pinney 1981). In February 1853, his son John Richard took up a pastoral

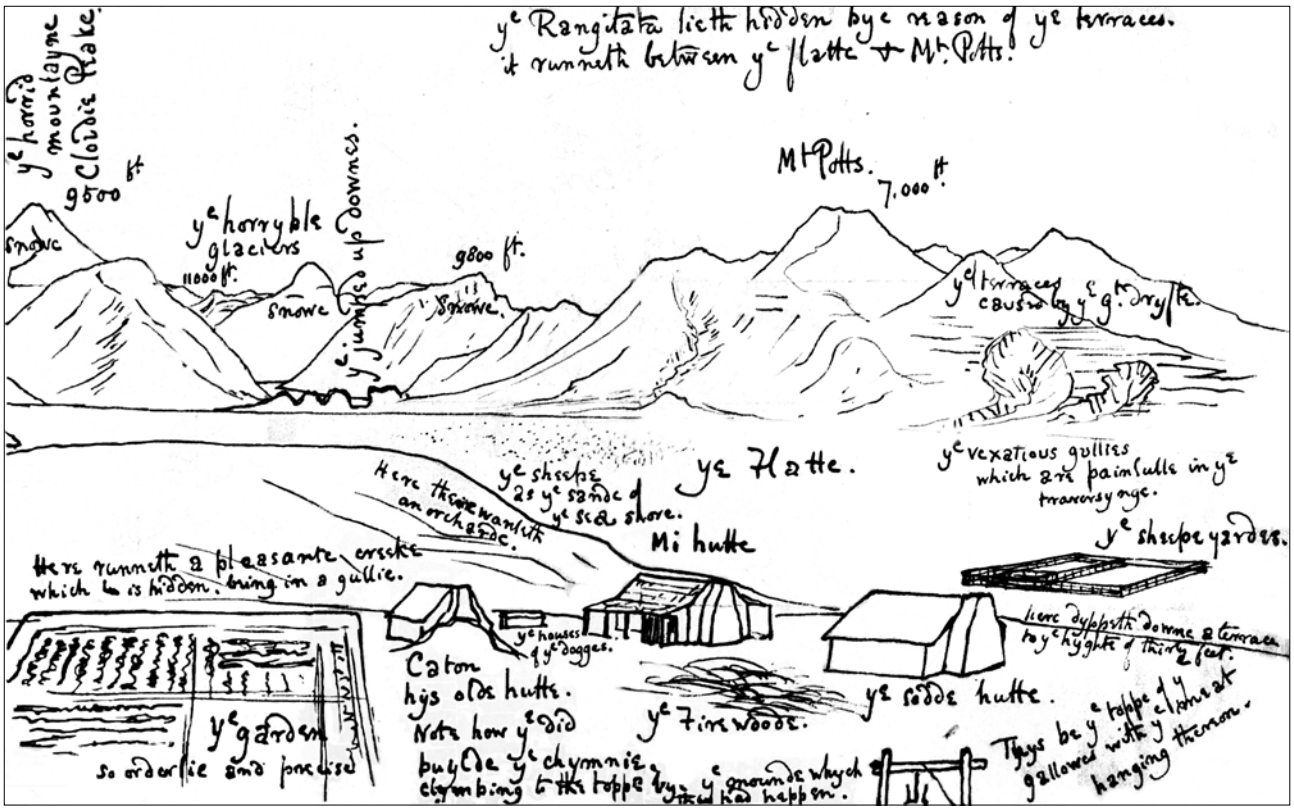

Figure 6. Pen and ink sketch of Mesopotamia Station, Canterbury. Drawn by Samuel Butler in the early 1860s. *Courtesy of Canterbury Museum (Samuel Butler Drawing; reference number CMNZ 16882).*

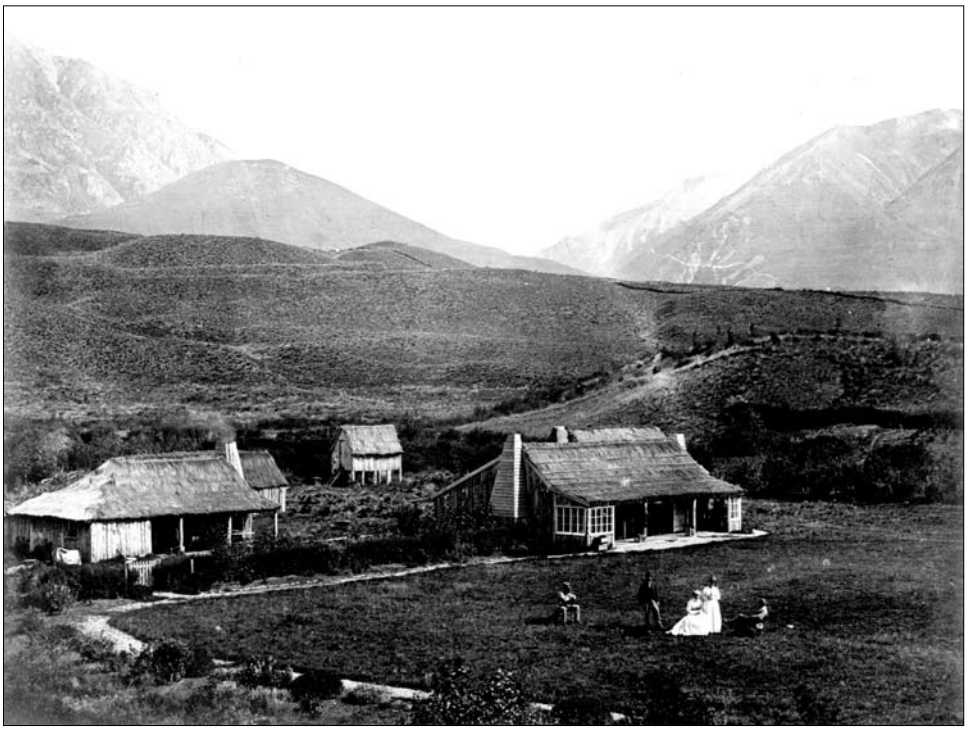

Figure 7. Cottages built at Mesopotamia Station, Canterbury, in the early 1860s. These are probably the cottages in Samuel Butler's sketch (Fig. 6). *Courtesy of Canterbury Museum (E.P. Sealy Photograph, Charles Beken Collection; reference number CMNZ 1900).*

licence for Run 14, extending from the northern bank of the Shag River to the Horse Range, and 8 miles (c. 12.9 km) inland from the coast. A second son, William, took up Run 80 by the end of 1854 to secure the hinterland up the Shag River, and a third son, Frederick, acquired Run 255 on the northerly bank by the end of 1858. In the 1860s, the Shag Valley runs, which were collectively known as 'Coal Creek', were purchased by the politician and administrator Francis Dillon Bell. He soon replaced the original damp cottage with a larger home (Pinney 1981).

On most stations, early tents or sod huts with thatched roofs evolved into a cluster of buildings, centred on the station homestead, which resembled a small village (Dominy 2001). The buildings eventually included a substantial home for the runholder or manager, a store house, woolshed, shearers' quarters, stock yards and a sheep dip (Dominy 2001). Barns, stables, smithies, cookshops, dairies, privies and killing sheds appeared on some homesteads as well.

At first, some shearing sheds had sod or treefern walls with canvas roofs, while others were built of slab with shingle roofs. Later, these buildings were larger and more commodious (Beattie 1947). The woolshed became arguably the most striking symbol of the New Zealand pastoral landscape, and the earliest designs were derived from Australia (Dominy 2001). Samuel Butler, who explored Canterbury in the 1860s, wrote that:

> 'A wool-shed is a roomy place, built somewhat on the same plan as a cathedral, with aisles on either side full of pens for the sheep, a great nave, at the upper end of which the shearers work, and a further space for wool sorters and packers. It always refreshed me with a semblance of antiquity (precious in a new country), though I very well knew that the oldest wool-shed in the settlement was not more than seven years old, while this was only two.'
>
> (Butler 1987: 24)

The woolshed at St Leonards, Amuri, was built in 1856 of posts from Pahau bush and thatched with toi toi (toetoe) (Gardner 1956). It is likely that the walls were made of laced and battened bundles of toi toi. Within a year, the woolshed was on a lean and had to be propped up. Soon the roof blew apart and had to be battened down. Eventually, the walls were lined with manuka brushwood from Hurunui scrub, the roof was re-thatched with raupo, a grating floor was put in, and post-and-rail fencing replaced the primitive yards of 1855 (Gardner 1956).

Some paddocks around the homestead were often used for growing crops such as English grasses (for hay), oats and root vegetables for feeding stock (Hargreaves 1966). Isolated huts were scattered on the station's outer rim for shepherds and musterers. Before wire fencing became widespread in the 1870s, the edges of runs were marked only on maps, and shepherds had to walk or ride along the boundaries to stop sheep from leaving the run or to stop foreign, possibly scabby, sheep from entering (Hargreaves 1966). Natural boundaries, such as rivers, were used whenever possible, to save labour and solve the problem of straying animals (Hargreaves 1966). Figure 8 shows the ruins of the Lake Guyon homestead and yards in the Amuri high country.

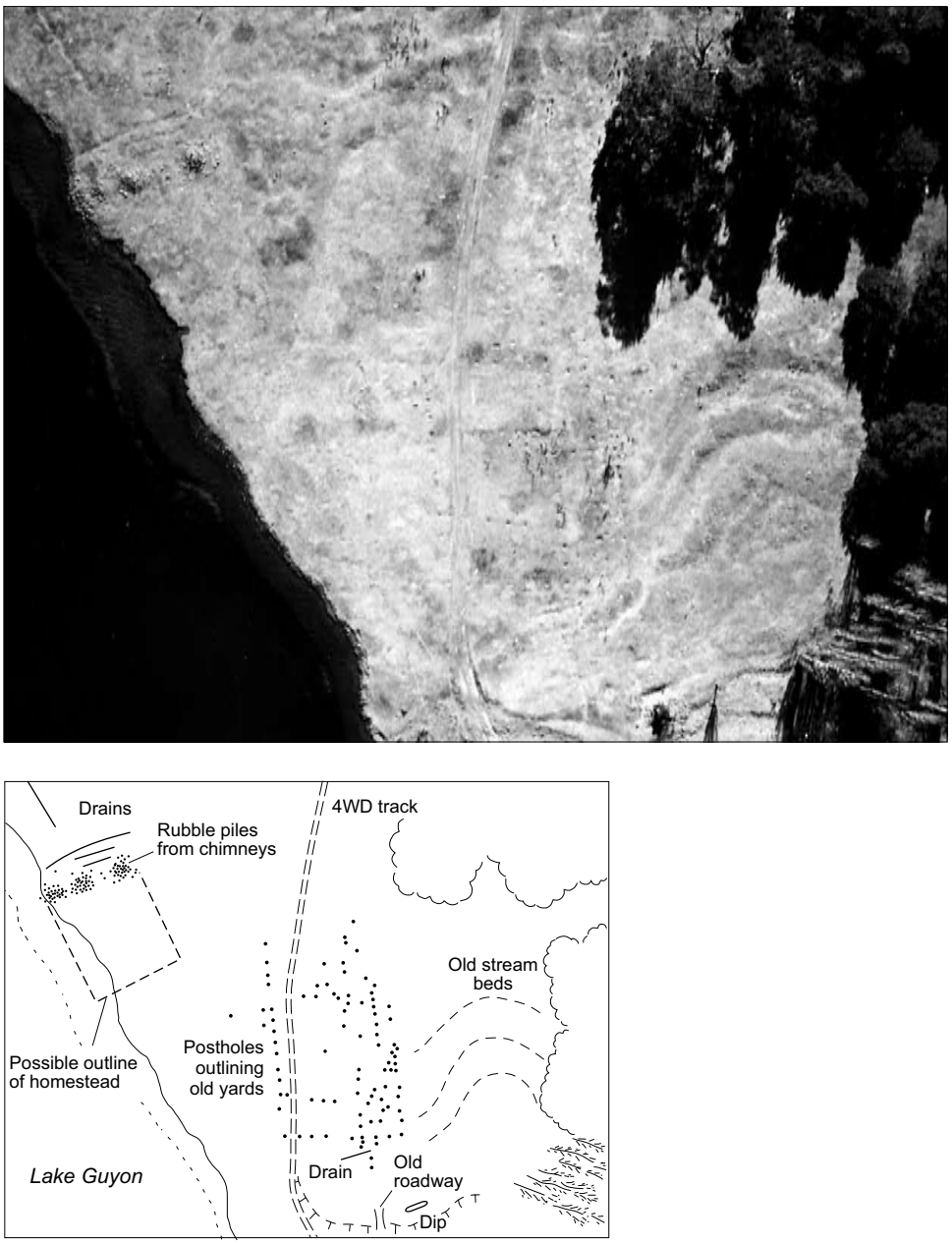

Figure 8. Aerial oblique and interpretive drawing of the ruins of the Lake Guyon Station homestead and yards on the north side of Lake Guyon (on what is now the St James Station). The yards probably represent various phases of construction following the establishment of the station in 1864–65 by W.T.L. Travers. View to the east. *Photo courtesy of Kevin L. Jones, DOC.*

By the late 1860s in Canterbury, a few grand houses and large woolsheds had been erected at high-country stations such as Mount Peel. Lord Lyttelton visited there in 1868 and noticed that J.B.A. Acland, who had more capital than most runholders and planned to make Mount Peel his family home, had been able to build and decorate to an unusual standard of completeness. He had a large woolshed that held 2000 sheep and his house was one of the few built of locally made brick (Scotter 1971).

More and more houses began to be built of timber that had been pre-cut in Christchurch (Scotter 1971). Others were made with thick cob walls. Some were spacious and comfortable, and double-storeyed, with up to 18 rooms. Examples are T.S. Mannering's house at Fernside and J.T. Brown's at Mount Thomas (Scotter 1971). Twelve years' growth of sheltering and ornamental trees had made a significant change to the landscape (Scotter 1971).

Shepherds' huts were constructed of readily available materials, such as stone. Gardner (1956) wrote about the Amuri of a century before:

> 'Perhaps the atmosphere of the 'fifties can now best be recaptured in the valleys of Molesworth and Tarndale, where musterers' huts standing alone in empty plains or hidden in gullies seem the forerunners of a closer settlement just beginning. No hut is within sight of another, and in spite of the longer views on the Pukahu Plain, the same must have been true of nearly all Amuri homesteads in the 'fifties.'
>
> (Gardner 1956: 79–80)

He imagined that, at the time, nor'westers 'howled from the mountain background unimpeded by sheltering trees' (Gardner 1956: 80). He also noted that Balmoral Station in Amuri was not country on which sheep could fatten, or squatters enrich themselves, and that its 'impressive area of over 60,000 acres carried an unimpressive number of sheep and an accumulating load of mortgage. It included much light stony country, as well as the great manuka scrub, and lay open to the sou'wester. Above all, it was poorly watered' (Gardner 1956: 138). Balmoral also suffered from absentee ownership. Shelter belts, frequently of *Pinus radiata*, were planted in windy locations, such as the Rakaia Gorge (Pawson 2001).

3.2.2 Wool washing and scouring

In the early years, sheep were washed to remove dirt, plant material and the yolk from the fleece so that buyers could inspect the clean wool. The yolk consists of wax produced by the sebaceous glands and suint by the sweat glands (Peden 2002). Most farmers washed their sheep 3 or 4 days before shearing to give the yolk time to be restored to the fleece. Sometimes warm water was used in specially made washing pens, but usually sheep were cleaned in a nearby stream (Hargreaves 1966). Because of the shortage of labour, the difficulty of getting a clean muster (sheep that were missed had to be shorn later in the grease), and the lack of holding capacity to keep the sheep clean before shearing, the practice was gradually dropped (Peden 2002). By the 1860s, the grease was generally sheared in (Hargreaves 1966). Scouring was carried out by some runholders in the late 1870s to remove grease and dirt from the wool before it was shipped (Peden 2002). A few of the more isolated and sizeable high-country stations built their own wool scours. Lake Coleridge, Morven Hills, Mount Nicholas and Benmore are cases in point (Thornton 1986). Iron boilers were used to heat the water adequately to make a scouring liquid (by adding soap that was not too alkaline), and the wool was placed in vats and agitated (by men wielding sticks) in the soapy solution. The fleeces were then lifted on to a draining tray to drip, and flipped backwards into a rinsing box supplied with a stream of cold water. They were drained and dried before being pressed into bales (Thornton 1986). However, most of the wool exported from New Zealand in 1882 was still in the grease (Peden 2002).

3.2.3 Sheep yards

Gardner (1956) wrote that at St Leonards, a sod sheep yard was built. Flax stalks laced together were used for part of the yards to form a wattle fence. Keeping sheep free from dirt and dust when they were 'folded' was a major difficulty. Their trampling caused dust and mud to permeate the fleeces (Peden 2002: 120). One remedy was to spread flax on the ground in the sheep yards, and this was done on St Leonards, Balmoral and Highfield. On one occasion, the flax caught fire at St Leonards and the woolshed yards burnt down (Gardner 1956).

3.2.4 Sheep dips

Many sheep imported from eastern Australia between the 1840s and the 1860s were infected with scab, and they spread the disease as they were driven to their new pastures (Hargreaves 1966). Nelson squatters installed tanks and began dipping sheep immediately after shearing, to combat scab and its rapid spread through the Wairau Valley. Some used tobacco water and others an arsenical solution (Sherrard 1966). Later, arsenic was replaced by sulphur and lime. Tanks of water were kept boiling to supply the dip solution, which had to be kept at a temperature of 84°F (28.9°C). On isolated runs, landholders continued to use tobacco water. By growing their own crops, they did not need to pay for costly packing in of other ingredients (Sherrard 1966). Before being dipped, badly infected sheep were frequently hand-dressed with a mixture of tobacco water and spirits of tar. The worst infected sheep were killed and their carcasses burnt (Sherrard 1966).

In 1856, the flock at St Leonards in Amuri District became seriously infected (Gardner 1956). Various methods were tried to treat the scabby sheep. At first, corrosive sublimate and spirits of tar (which sometimes poisoned the sheep) were used as hand-dressings, or casks of tobacco water served as sheep dips (some tobacco plants were bought and some grown on the run). From 1857, sulphur was used in conjunction with the tar and tobacco (Gardner 1956). A dipping trough was constructed in the creek near the home station after shearing, and boilers were set up alongside. Unfortunately, the water leaked out of the trough and then the creek dried up (Gardner 1956).

Early dips, 'plunge dips', were built as a trough about 20 m long and 2 m deep (Thornton 1986). A number of men were needed to completely immerse large flocks of sheep in this most common type of dip. The rarer spray dip was a carport-like structure with a flat galvanised-iron roof that had shallow parapets to contain the solution (Thornton 1986). The liquid sprayed through the many holes that had been punched through the iron roof. On small properties, the 'pot' dip (c. 0.6 m deep and 0.6 m wide), which held fewer sheep and required less labour, was more popular (Thornton 1986). Most dips had draining pens for the sheep to pass through, and the solution was recycled (Thornton 1986).

John Rutherford, a Victorian squatter who settled in Amuri District, apparently made the first effective Australasian remedy against scab (Gardner 1956). In 1854, he boiled tobacco and sulphur together and

poured the mixture into a dip kept at 38–49°C. Sheep were immersed for 2 min, and dipped a second time 16 days later to kill the insects that had hatched out in the interval. Because diseased sheep habitually scratched and rubbed themselves against fences and trees, infected ground was left ungrazed for periods of up to 6 months. Another recipe used in Amuri in the 1850s was 12 kg of tobacco boiled in 25 L of water, and 1.6 kg of arsenic and 400 g of soda boiled separately; both liquids were then combined (Gardner 1956). A long wooden tank was built on the ground, with a draining stage at one end and a sheep yard at the other. The sheep were soaked for 5 min in the tank, and then put on the stage until the excess water had dripped back into the tank. This process was repeated twice more at intervals of 16 days to kill the parasite (Gardner 1956).

Scab did not prevent the St Leonards' flock from increasing. Whereas in 1855 there had been 2068 sheep, by 1860 there were more than 11 000 (Gardner 1956). In August the same year, the first wire fence went up. While this was a barrier against the spread of infection, sheep on the unfenced run caused further serious scab outbreaks. A large proportion of the flock was infected and the whole flock had to be dipped (Gardner 1956).

3.2.5 Cattle

Cattle were frequently pastured on high-country runs as well as sheep. For example, in 1872, Lauder Station on the Manuherikia River in Otago carried c. 600 cattle and 12 000 sheep (Pinney 1981). Naturally, fences and the walls of stock yards needed to be higher and stronger than those for sheep to prevent cattle from roaming.

3.2.6 Transport

Beaches and riverbeds were often used as highways (Mahoney 1991). Settler tracks were cut or burnt through bush and scrub in the high country. Pack tracks were designed specifically for teams of horses, and were gently graded and generously wide (Mahoney 1991). They allowed for movement of horses, trains of packhorses, mobs of stock, and sledges carrying heavy machinery or goods. Most pack tracks were constructed in isolated and difficult terrain, where roads were expensive to build (Mahoney 1991). They were too narrow for wheeled vehicles.

Mahoney (1991) listed other features characteristic of pack tracks as:

- Stone benches in small side creeks to provide an even-bottomed ford
- Meandering trajectories in and out of gullies
- Zig-zags on steep hillsides
- The avoidance of stressful and dangerous crossings by travelling along one side of a river
- Huts on longer tracks, some with yards or grassed clearings for horses
- Side cuts in steep country and fill across swampy ground

Pack tracks criss-crossed the South Island, forming an extensive transport and communication network (Mahoney 1991). Construction began in the 1840s and continued through to the 1920s (Mahoney 1991). They were built for many purposes—prospecting, mining, droving, farming, tourism and general communications—and were financed by central, provincial and local government, and private industries (Mahoney 1991). By the late 20th century, physical remains were not always evident. Some tracks had been upgraded to roads and destroyed in the process, some had become overgrown and neglected, and some had been transformed into scenic walking tracks (Mahoney 1991).

Bullocks were brought in to pull sledges or drays and they frequently carted heavy loads such as wool, timber or firewood (Beattie 1947). Although slower than horses, bullocks were more patient, steady and sure, and because they gained better traction with their cloven hooves, they could attempt the high country's steeper gradients (Pinney 1981). The most preferred bullock wagons were made of blue gum and were imported from Sydney at a cost of c.£28 (Hargreaves 1966). Bogs were bridged with scrub, and creek banks were sloped to allow bullock sledges or drays to cross (Beattie 1947). Stone cairns and snow poles acted as route markers. Over time, tracks became distinctly marked. In some areas, risky mountain traverses and dangerous river crossings were hazards that settlers were forced to negotiate (Beattie 1947).

A team of bullocks hauling a dray-load of wool averaged c. 10–12 miles (c. 16–19 km) a day (Jacomb 2000). For example, at St Leonards Station in Amuri, the first wool clip was shipped from Gore Bay in April 1855, but the following year the clip, amounting to 40 bales, was carried by dray to Kaiapoi in four trips over Weka Pass (Gardner 1956). The shortest trip took 10 days both ways. Before fences were built, much time was wasted looking for lost mules, bullocks and horses (St Leonards seems to have been short of riding horses, and station workers were forced to walk prodigious distances).

The appearance of horses on a run was a sign of progress, and following this bridle tracks formed (Jacomb 2000). On steep and tricky slopes, steps or crude ladders were made for horses. Saplings were used, and the cross bars were lashed with supplejack. Horse-drawn drays and wool wagons were common by the late 1870s, as were long-bodied four-wheeled bullock wagons, but spring carts were rare (Jacomb 2000).

In the early 1860s, the Marlborough Provincial Council set aside land for accommodation houses and reserves for stock travelling from the high country in Kaikoura, at the mouths of the Clarence and Hapuku Rivers, and at Boat Harbour (Sherrard 1966). At the Clarence ferry, a wire rope securely tied on both banks of the river was attached to the boat. When the river ran high, travellers paid 2s 6d to be ferried across the river with their luggage while their unsaddled horses swam across the raging torrent (Sherrard 1966).

3.2.7 Accommodation houses

Since many high-country sheep runs were several days' journey from the closest port or landing place, early travellers were accommodated at the small homesteads of the early runholders (Jacomb 2000). Later, boat ferries and accommodation houses sprang up at river crossings. Canterbury archeologist Chris Jacomb wrote that:

> 'The siting of most accommodation houses was determined by the distance a bullock wagon could travel in one day, along with the locations of suitable ferry crossings along the route to the nearest port. Hence the settlement pattern of the Canterbury [Province] was, to a large degree, set by the distance a team of bullocks could haul a wagon loaded with wool.' (Jacomb 2000: 56–57)

Early pastoral farming communities also used accommodation houses for many other purposes such as post offices and places to hold meetings, church services, weddings, schools and dances (Jacomb 2000). The houses served as a social nexus.

In the early 1860s, the Marlborough Provincial Council set aside land for accommodation houses and reserves for stock travelling from the high country in Kaikoura, at the mouths of the Clarence and Hapuku Rivers and at Boat Harbour (Sherrard 1966). The Kekerengu accommodation house was station property, leased to the ferry keeper, who catered for station hands as well as for the travelling public. The Nelson Provincial Council established accommodation houses on the Rainbow River route at Tophouse and at Tarndale (Fig. 9).

High-country runholders with stations en route to the goldfields could not accommodate all the miners who rushed to the diggings, and demand

Figure 9. Aerial oblique of the second Rainbow accommodation house and adjacent stock or horse yards (in the foreground, outlined by postholes on the terrace edge above the scrub-covered stream bed). View to the southwest. *Photo courtesy of Kevin L. Jones, DOC.*

escalated for accommodation houses at strategic points, especially at river crossings (Gardner 1956). When the three South Island gold rushes began (Otago 1861, Marlborough 1864 and Westland 1864–65), the traffic on Amuri roads increased swiftly and even became rather threatening to local inhabitants (Gardner 1956). At the same time, there was a conflict over the best route to be developed between Canterbury and the West Coast, as a contemporary cartoon demonstrates (Fig. 10). In 1860, the route from Nelson to Canterbury through the Wairau Gorge and across Hanmer Plain was greatly improved, and large reserves were set aside to encourage qualified people to set up accommodation houses (Gardner 1956). In a return of accommodation house reserves for Amuri District dated 28 June 1864, five were listed: Tophouse—c. 200 acres (81 ha); Tarndale—6100 acres (2470.5 ha); Hanmer Plains—2540 acres (1028.7 ha); junction of Acheron and Clarence Rivers—2650 acres (1073.25 ha); and Highfield, Amuri—150 acres (60.75 ha) (Gardner 1956). Extra land was needed to grow food for travellers and their horses or bullocks, and also to provide fodder for stock. A house at Hurunui with a ferry boat was established late in 1864 (Gardner 1956). It contained 13 rooms, with stabling to hold six horses (the ferry consisted of two ferry boats with wire warp stretching across the river). The house completed the chain linking Hurunui to Tophouse, making it possible for travellers to pass through Amuri District knowing that accommodation would probably be available at the end of each day (Gardner 1956). Figure 11A depicts the Amuri runs in 1858, and Fig. 11B shows the runs, homesteads and accommodation houses in 1889.

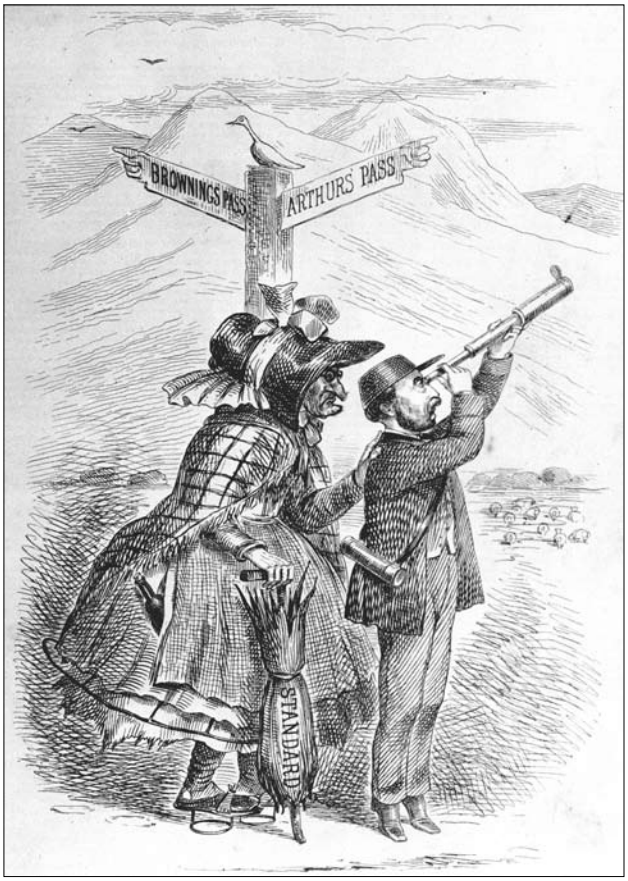

Figure 10. 1865 cartoon depicting the conflicting claims of Browning Pass and Arthur's Pass to become the stock route from Canterbury to the West Coast. A quick, safe route was needed during the gold rush. *Courtesy of the Alexander Turnbull Library, Wellington, New Zealand (reference number 303 MNZ ¼).*

3.2.8 Droving

In the mid-1850s, Amuri runholders began to send sheep into Canterbury (Gardner 1956). The 1860s gold rushes expanded these markets and made others. The disposal of surplus sheep for profit was an important way for landholders to supplement their incomes and to cull excess sheep (Gardner 1956). The river crossing at Hurunui River was the gateway to the Canterbury markets, but the enactment of stricter scab legislation in Canterbury in 1858 (Gardner 1956) led to the establishment of a 3000-acre (1215-ha) stock reserve between the Hurunui and Waitohi Rivers, east of the contemporary railway line (Gardner 1956). This meant that it was seldom profitable to drive Amuri sheep direct to the Christchurch market because sheep from Nelson Province, of which Amuri was a part, had to be dipped and granted a clean certificate by a Canterbury inspector. Dipping cost 1 shilling a head for the first 1000

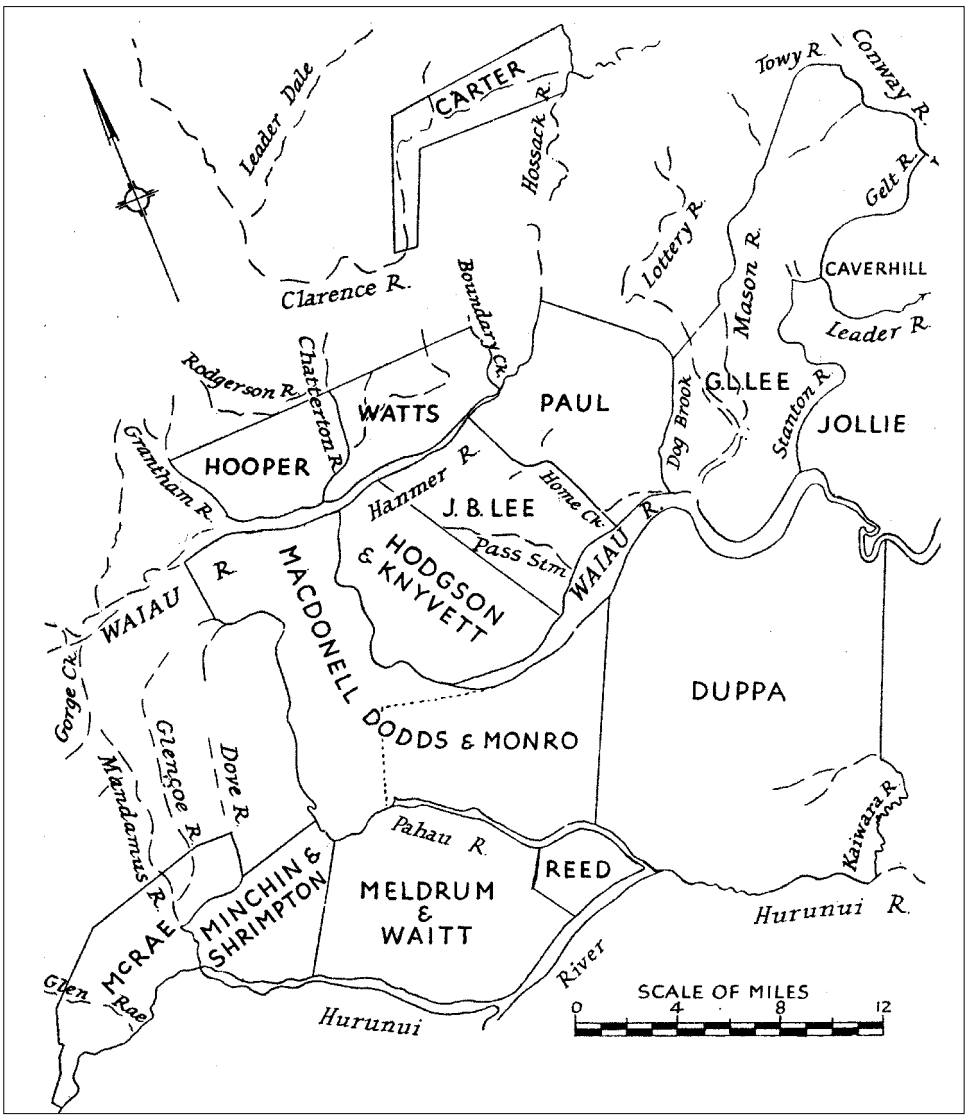

Figure 11A. The Amuri runs in 1858, from Gardner (1956).

sheep and eightpence a head thereafter, and if sulphur was used in the dip, the meat became tainted (Gardner 1956).

Store sheep and cattle from St Leonards Station, Amuri, were sent in droves along the Main North Road in the 1860s and 1870s to Kaiapoi and Marshland for fattening before going on the Christchurch market (Gardner 1956). In 1871, 14 000 sheep were sent, and in 1872, 16 000. Large areas on St Leonards were cultivated and planted in English grasses or rape for fattening sheep, or in oats for the many horses on the station (Gardner 1956).

The West Coast market was difficult to access and droving to it from Amuri lasted only about 12 years. In 1865, the main route was over Harper Pass at the head of the Hurunui River (Gardner 1956). The Nelson Provincial Government also cut a track from Hanmer Plain to the Grey Valley so as to connect the Hurunui Plains with the valleys of the

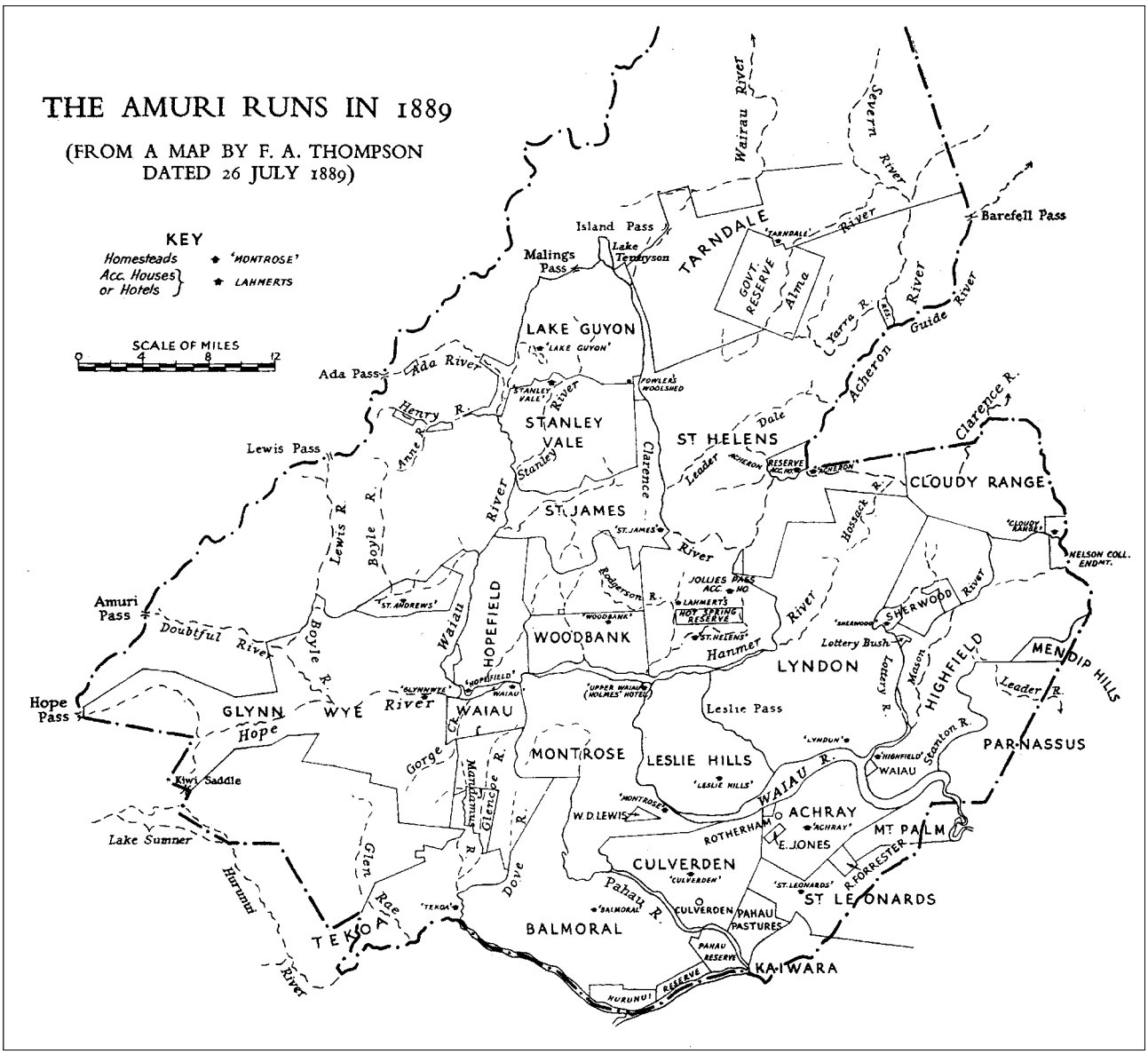

Figure 11B. The Amuri County in 1889, showing runs, homesteads and accommodation houses, from Gardner (1956).

Waiau, Maruia and Ahaura Rivers (Gardner 1956). Runholder and writer Edgar Jones described the two passes:

> 'There were two ways of going there [to the West Coast], one by Lake Sumner, over the Hurunui Saddle, and down the Teremakau [*sic*] to the Arahura, the saleyards for Hokitika; the other up the Doubtful river, over the saddle, and down the Ahaura to Greymouth or Reefton.'
>
> (Jones 1933: 44)

He recalled that in fine weather the journey droving sheep over to the West Coast took c. 16 days, and about three coming back. The number of sheep taken was between 400 and 600. Sometimes delays were caused by floods and snowstorms (Jones 1933). After 1865, most of the rushes were to goldfields north of the Grey River/Mawheranui, and consequently the Ahaura Pass was used most frequently; the Hope, Lewis and Ada Passes were not used for droving stock (Gardner 1956). During the

late 1860s, fat stock were sent from Leslie Hills Station on the front country of Amuri, through the high country and mountains, to the West Coast goldfields. Between 1867 and 1869, c. 3000 sheep were driven over the ranges. Several mobs also went from Mendip Hills. By the late 1870s, traffic to the West Coast was diminishing and eventually, with the decline of the West Coast goldfields and population, it petered out (Gardner 1956).

3.2.9 Fencing

At first there were no fences. Shepherds and boundary keepers were employed to keep the high-country flocks together, and brushwood yards were constructed to enclose sheep at night and to keep out wild dogs (Beattie 1947). In Amuri, wattle was used at St Leonards Station in 1855 and at the Glens of Tekoa (Thornton 1986). As soon as possible, farmers began to use whatever materials came readily to hand (mainly wood, stone or sod) to construct fences (Hargreaves 1966). The post-and-rail method of fencing consisted of horizontal rails tapered at the ends passing through a series of holes in upright posts, with a minimum of three and maximum of six rails (Thornton 1986). Where timber was scarce, ditch-and-bank methods were employed. Here, a sod wall, c. 4 feet (1.2 m) high, was built like a stone wall, adjacent to a ditch up to 6 feet (1.8 m) wide and 3 feet (0.9 m) deep. A hedge, usually gorse, was generally planted on the sod bank (Pawson 2001). In the 1860s, sod fences were built at Fairlight Station near Garston in Southland (Thornton 1986). Both post-and-rail and ditch-and-bank methods proved expensive because labour was scarce and much was required (Hargreaves 1966). Stone was used to erect walls wherever it was plentiful, and in Central Otago, schist was also employed widely for fencing (Thornton 1986).

Wire introduced from the late 1850s had a very heavy gauge (No. 4 black iron) and was difficult and expensive to transport (Thornton 1986), so was not suitable for fencing. Furthermore, before staples were introduced in the late 1860s, wooden posts had to be drilled to take the wires (Thornton 1986). Where timber or schist was unavailable, heavy cast iron posts had to be carted in, by bullocks wherever possible. Despite these drawbacks, in 1863 iron wire fencing was put up at Clent Hills Station in the Canterbury high country, and in 1865 at Blue Cliffs Station, tenders were called for an 8-km-long fence with iron standards, six wires and 15 strainers to the mile (Thornton 1986). Wire imported in the late 1860s (No. 8 galvanised) was lighter, cheaper and more durable, and this, in combination with the availability of staples, meant that wire fences became more common (Thornton 1986).

At that time, with the average weight of sheep decreasing and fleeces losing condition owing to overstocking, flocks were culled to get rid of surplus animals (McAloon 2002). Some were slaughtered and boiled down for tallow, while others were driven over cliffs or killed and buried. For example, at Glenmark in 1870, 12 000 wethers were killed for boiling down (McAloon 2002). Later, in the late 1870s, high-country runholders often responded to declining stock numbers by splitting blocks into fenced paddocks. Grazing land was rested and pastures were better

managed (Hargreaves 1966). Wire fencing in tussock country reduced the need for shepherds and boundary keepers and checked the spread of scab (Hargreaves 1966). By 1879, barbed wire was being imported into New Zealand (Hargreaves 1966). Whereas in 1851 c. 30 500 acres (c. 12 353 ha) were fenced in New Zealand, in 1881 c. 16 000 000 acres (c. 6 480 000 ha) were fenced (Hargreaves 1966).

3.2.10 Boiling down plants

E.G.T. Gooch rendered down the first batch of surplus Kaikoura sheep for tallow on 9 October 1869 at a plant in Fyffe Cove. A description of the boiling down plant, for steaming carcasses under pressure, is included in J.M. Sherrard's history of Kaikoura District:

> 'A large shed, about 50 feet long by 20 broad, with a huge vat, resembling an egg, apparatus for generating steam, and adjacent yards, together occupy the whole area. The vat formed of quarter inch iron plates, firmly riveted, is about seven feet in diameter by fourteen in length. Its weight is about four tons; and it is capable of containing the carcases of about 400 sheep. To support such an immense weight four very strong castings are secured by twenty screw bolts, at about equal distances round the vat, the bottom of which is nearly five feet from the ground. The castings referred to rest upon four uprights of seasoned Kohai, about twelve by twelve, very strongly braced and bolted together, and resting upon the bedrock. The top of the vat is about twenty feet from the ground. The carcases to be operated upon will be passed up to a stage, where a man or two will drop them in. The tallow will flow off, by means of two large taps placed in the side of the vat, into large troughs, to be washed, previous to being casked. The refuse from the vat can be allowed to fall out of its end into a truck which will convey it by a tramway to the beach. The boiler is vertical, internally fired, and the steam is super-heated, before passing into the vat. The boiler standing on an iron frame without brick work has been erected a few yards from the vat, and the steam will pass into it by means of suitable pipes. The slaughter house, 36 by 18 is detached, and every attention has been paid with regard to cleanliness ...'. (Sherrard 1966: 178)

Gooch's plant was used by Kaikoura runholders until the Sheep Act 1878 imposed stringent anti-scab measures (Sherrard 1966). New plants were then also constructed on some of the sheep stations.

At Benmore Station, northern Otago, boiling down began in May 1870 (Pinney 1981). One man killed the sheep, five to seven men boiled, a night boiler man kept the pot simmering, four men washed the skins and three men sorted them. Tallow was taken in casks to Oamaru by wagon. The boiling down season finished in July. In 1871, 2849 sheep, averaging 17 kg, each yielded 4 kg of tallow. Station hands were fed the legs and the tongues, and some legs were salted (Pinney 1981).

In 1864, the Amuri District carried 237 000 sheep; 6 years later there were 428 000 (Gardner 1956). By 1869, the price of wool and sheep had fallen (Gardner 1956). Lyndon, St Leonards and St Helens Stations established

boiling down works to offset falling prices (Gardner 1956). John Tinline at Lyndon bought his vat and steam generator for 'boiling down' from Melbourne (Gardner 1956). Two hundred sheep were disposed of daily. The average weight of tallow from each was c. 8 kg, the legs were smoked and cured as hams, and the skins were scoured. Tinline expected to process 10 000 of his own sheep in the first season. J.H. Davison, manager at St Leonards, with the help of his blacksmith improvised much of his equipment on the station and adapted the dipping apparatus (Gardner 1956). Unfortunately, the valves cracked, the vats leaked and the pump broke. In 1870, a steaming vat was made for the station by Andersons of Christchurch (Gardner 1956). Timber was used for fuel; boiling down 11 000 sheep took 2400 m of timber. In 1874, 200 sheep were sold to the Canterbury Meat Export Company for preserving (Gardner 1956). At Greenhills, Kaikoura, the powdered residue of meat and bone was spread as fertiliser (Sherrard 1966). In 1883, between the Conway River and Kekerengu, 25 000 sheep were still being boiled down every year because there was no sale for them (Sherrard 1966). In the late 1880s, boiling down plants would fall into disuse with the growth of the frozen meat industry, the opening of roads and the eradication of scab (Sherrard 1966).

3.2.11 Gold mining

Archaeologist Jill Hamel wrote that the major Otago gold rushes between March 1861 and mid-1864 'were politically significant, involving thousands of miners, but archaeologically left few traces' (Hamel 2001: 129). She also said that 'There is an important anthropological distinction to be made between the gold rushes and the more settled mining of subsequent years which created nearly all the existing gold fields' sites' (Hamel 2001: 127).

For example, although Goodgers Flat in the Lindis Valley was covered with hundreds of tents with stone or sod walls and sod chimneys when the first Otago gold rush occurred in March 1861, within a year only disintegrating walls and irregular mounds and potholes from the diggings remained (Hamel 2001). The tents of the shopkeepers who followed the miners also left few signs. Subsequently, Goodgers Flat was ploughed.

The next rush, at Gabriels Gully in May 1861, was larger and far more prolonged (Hamel 2001), but the physical remains were later totally destroyed by hydraulic elevating and outwash from sluicings upstream (Hamel 2001). This was despite the fact that at the time, according to contemporary observer Charles Money, there were 'canvas and galvanised iron stores, public-houses, restaurants, shanties of all descriptions and with every conceivable name, scattered around in all directions; while advertisements of nigger minstrels, goldbuyers' prices and placards, were flaunting everywhere' (Money 1972: 9).

The Dunstan workings (Clutha gorges, Kawarau Gorge, Bannockburn and the Lowburn section of the Clutha River/Mata-Au) and the workings in the lower Nevis, Arrow, Shotover and Skippers Rivers were mostly on river banks and were later erased by flooding, dredging or the construction

of hydro dams (Hamel 2001). Some physical remains can be found at Murphys Flat, Trimbells Gully, part of Bendigo Creek, Brackens Gully, upper Cardrona, Campbells Creek, and Golden Gully at the Serpentine (Hamel 2001).

The first water races for sluicing claims were built in early 1862 (Salmon 1963). Miners who came from Australia quickly adapted their skills in race building to the New Zealand high-country terrain. By 1863, c. 120 miles (c. 193 km) of head races had been cut, supplying many reservoirs (Hamel 2001). Hydraulic nozzles, for aiming a forceful jet of water onto a rock face, began to be used a few years later (Hamel 2001).

Some Maori became involved in prospecting for gold. For example, in 1862 Raniera Taheke Ellison of Kai Tahu and Te Ati Awa joined the Otago rush, and he and two companions, Hakaraia Haeroa and Henare Patukopa, discovered gold at what became known as Maori Point on the Shotover River (Anderson 1993). The European miners present were unable to swim across to a likely, tantalising beach, but the Maori did, and Ellison struck gold (Olssen 1984).

Chinese goldminers arrived in Otago from 1865, initially from Victoria, Australia, and later from China (McKinnon 1997). Mostly they worked as diggers on small claims and they were skilled at water race construction (McKinnon 1997). Chinese camps sprang up either on the field or on the outskirts of a town. Most notable was the Chinese camp at Lawrence. This had a hotel and other boarding establishments and two joss houses (where joss or incense was burnt to remember ancestors) (McKinnon 1997). Two other examples were the settlements near Arrowtown (where the ruins still stand) and at Round Hill mine in Southland (McKinnon 1997).

3.2.12 Mixed-crop livestock farming

Within regions of extensive sheep farming were areas of more intensive farming. For instance, after the gold rush, some Central Otago goldminers turned to agriculture, and water races built originally for sluicing in the high country were used for irrigation (Hargreaves 1966). Growing grain and raising livestock were common semi-subsistence activities, and specialised fruit production also began. The first commercial orchard in the Central Otago high country is said to have been planted near Clyde in 1864, with others following at Conroys Gully, Alexandra and Coal Creek (Hargreaves 1966). Market limitations were reduced when the railway arrived at Lawrence in 1877 (Hargreaves 1966). Mixed-crop livestock farming was primarily a South Island phenomenon. By the 1860s, areas were appearing on the Taieri–Tokomairiro Plains southwest of Dunedin (Hargreaves 1966). By the 1870s, with the extension of railways, mixed-crop livestock farming was expanding and extensive pastoral farming was being displaced and pushed further inland (Hargreaves 1966).

3.3 LAND TENURE

3.3.1 The transfer of high-country land from Maori to Europeans

On the northeastern tip of the South Island, in March 1847, agreement was reached between Governor Grey and the Ngati Toa chiefs for the Wairau Valley (Evison 1993). The Government was to pay £3000, spread as instalments over a number of years. Ngati Toa retained substantial reserves in the district. Also included in the Wairau Purchase, at the request of Ngati Toa, was the eastern coast of the South Island as far south as Kaiapoi (Evison 1993). Harry Evison commented: 'In selling Kaiapoi *pa* to the Governor, Ngati Toa were recorded in the Wairau Deed for all time as having been the owners of it ... Te Rauparaha's victory then would be regarded as permanent' (Evison 1993: 235–236).

In May 1848, Governor Grey announced that he had 'discovered a principle' for separating Maori tribes from their 'waste lands' (Evison 1993). From that point on, he required tribes selling land to surrender an entire block and then rely on the Government to provide them with what it considered 'an adequate portion' as official reserves (Evison 1993). This would be regarded as a gift from Government.

On 12 June 1848, Native Secretary Henry Tacy Kemp, who had been commissioned by Lieutenant Governor Edward John Eyre for the Kai Tahu sale of the Otakou Block, met with the Kai Tahu leader Te Matenga Taiaroa and other Otago and Canterbury chiefs and heads of hapu on board the HMS *Fly* at Akaroa, Banks Peninsula (Evison 1993). According to the Deed read out in Maori, Kai Tahu agreed to sell all the land along the east coast of the South Island:

> '... beginning at Kaiapoi where Ngati Toa sold, and at the boundary of Whakatu [Nelson], continuing on to Otakou, joining the boundary of Symonds's purchase, continuing from this ocean until it reaches the mountains of Kaihiku, then continuing on to the other ocean at Lake McKerrow (Milford Haven).'
>
> (Kemp's Deed 1848, cited in Evison 1993: 261)

The payment was to be £2000, paid in instalments. The Deed promised Kai Tahu all their mahika kai and kaika nohoanga (Evison 1993).

Historian Harry Evison wrote that when Kemp sent his report to Eyre, he attached a 'translation' of the Deed, which was to become the official version. It was different in meaning from the Maori text that he had read out to Kai Tahu on board HMS *Fly* (Evison 1993). Whereas Kemp had informed Kai Tahu that they would receive large reserves when the land came to be surveyed, according to the translation the provision of Maori reserves was to be at the Government's discretion. Maori were to receive only their kaika nohoanga and other small areas (Evison 1993). In 1848, Kai Tahu were awarded reserves totalling 6359 acres (c. 2575 ha) (Evison 1993).

In December 1849, Walter Mantell (who had been appointed to the office of the Commissioner for Extinguishing Native Titles) sailed to Otago to pay the Otago chiefs £1000 for the final instalment of Kemp's Purchase,

due for payment on 12 December 1849 (Evison 1993). Mantell prepared two fresh parchments as receipts, one inscribed in English, the other in Maori. They had different meanings (Evison 1993). In his Maori-language receipt, Mantell avoided any mention of Kemp's Deed Map and the boundaries shown on it. In official (English-language) terms, the Kai Tahu Block meant the block shown on Kemp's Deed Map, which (unlike the Deed itself) encompassed the West Coast and the mountainous interior between east and west. Evison wrote:

> 'Those who could not read would also follow the words of the Maori version when they heard them. The meaning of the Maori version ... would give the chiefs the impression that they were signing for payment for the sale of the area that they had agreed to sell Kemp, – not for the larger area shown on the Map, which they had objected to when shown it by Mantell at Akaroa in 1848.' (Evison 1993: 328)

Some chiefs and heads of hapu signed at Koputai (Port Chalmers) on 17 December 1849 and at Akaroa on 28 December 1849 (Evison 1993). The English receipt became the official version; the Maori version was never published (Evison 1993).

In mid-1850, after the New Zealand Company gave the British notice that they were surrendering their Charter and ceasing operations because of poor profits, the British Parliament passed the Canterbury Association Lands Settlement Bill. This transferred to the Association the Company's former right to dispose of all the 'waste and unappropriated land' in the Canterbury Block on 14 August 1850 (Evison 1993). The new Act confirmed the Association's price of £3 per acre for the purchase of land, and £1 a year per 100 acres to lease unsold land within the block (Evison 1993).

3.3.2 Land administration in Canterbury and Otago

The original Canterbury Block, promoted by members of the Church of England and established jointly by political theorist Edward Gibbon Wakefield and the Canterbury Association's resident agent John Robert Godley in 1850, extended from the Waipara River in the north to the Ashburton River/Hakatere in the south, and from the coast to the dividing ranges (Evison 1993). Within this block, conditions of land tenure were set by the Canterbury Land Settlement Act 1850, enacted by the Imperial Parliament, and waste land was to be sold at £3 an acre (Evison 1993). The entire Canterbury Province was twice as large, extending north from the Waipara River to the Hurunui River, and south from the Ashburton River to the Waitaki River (Hensley 1971).

By the time the New Zealand Company had stopped operating in 1850, not much land had been sold at this price and it had become obvious that sheep runs would be more profitable than small farms (Evison 1993). New Zealand Company rules allowed land to be leased for pasture within its settlement blocks (Evison 1993).

In December 1850, the first four ships of the Canterbury Association arrived at Port Cooper (which was renamed 'Lyttelton' after their chairman, Lord Lyttelton), carrying 782 passengers (Evison 1993). At this time, the

annual rental for these pastoral leases was £1 per 100 acres (Evison 1993). In May 1851, Godley relaxed the rules and pastoralists were able to lease land from the Association on a year-to-year basis at a fraction of the original rental, beginning at one-twentieth (Evison 1993).

Later in 1851, Governor Grey issued his regulations for the pastoral leasing of Crown land outside the New Zealand Company's Canterbury Block, which included high-country land, and Otago Block, which was 400 000 acres (162 000 ha) of coastal and hill country centred on Dunedin (Evison 1993). Grey's terms were far more favourable than Godley's. The cost of a Crown depasturing license was to be £5, and the annual rental was based on the number of sheep the runholder carried on the land, at one penny per head (Evison 1993). The runholder was given 5 years to build up his flock, and was then permitted 2 acres (0.81 ha) for each sheep. The Crown leases were for a 14-year term. The runholder was obliged to erect specified buildings as improvements and to have the land stocked to a certain level with sheep or cattle within a year or more (Evison 1993). From October 1851, Crown pastoral leases were issued by commissioners appointed by Governor Grey (Evison 1993). In February 1852, the Canterbury Association introduced leasehold regulations allowing for pastoral runs within the Canterbury Block of up to 20 000 acres (8100 ha) at Godley's reduced rental. Fifty-two runs had been taken up within the Canterbury Block by the end of 1852, half of them by Canterbury Association settlers (Evison 1993).

3.3.3 'Squatting'

The Wakefield system in Canterbury was challenged by the appearance of an increasing number of Australian squatters from 1851 (Hensley 1971). The term 'squatter' was applied to graziers who settled without legal title on areas outside official settlements, and came from Australia, where squatting had been widespread since the 1830s (Condliffe 1959). The squatters had been driven out of Australia by severe drought over several seasons (Hensley 1971). In May, Godley disobeyed his instructions as the Association's agent and, because Australian squatters were bringing in much-needed capital and stock, allowed them to have pasturage rights on the same terms as the Canterbury Association's settlers (Hensley 1971). Historian G.C. Hensley noted that the Australian squatters:

> '... were self-made, often of Scottish descent, canny, hard-bitten, with a good "eye for country" and the practical knowledge to put it to use. Their experience was an invaluable infusion for colonists from England who, whatever their enthusiasm for its possibilities, had little idea of the techniques of working a sheep run.' (Hensley 1971: 33)

Pastoralism fared better than agriculture in Canterbury, despite Canterbury Association antipathy toward an industry 'leading to the scattered and disintegrated sort of society which the Wakefield system had been designed to prevent' (Hensley 1971: 31). By 1853, almost all the unoccupied land on the Plains had been taken up, and new runs were being formed in the gorges, river flats and ranges of the high country (Hensley 1971). The Canterbury Association aimed to prevent the emergence of large

runs because this would undermine the system of settlement formulated by Wakefield. According to this system, land was bought cheaply from Maori, and sold at a price 'sufficient' to keep it out of the reach of wage-earners, to attract capital from well-to-do immigrants and absentee investors (McIntyre 2002). Profits were used to finance the venture, which provided free passages for workers (McIntyre 2002). Hensley wrote that 'Wakefield dreaded the growth of squatting on the Australian model, with its social irresponsibility, its huge tracts of land locked up from settlement, and its neglect of both the civilising pleasures and benefits of community life' (Hensley 1971: 31–32).

Under the Crown Lands Ordinance (New Ulster) 1849, which was extended to the whole of New Zealand (exclusive of the Canterbury and Otago—New Zealand Company—Blocks) by the Crown Lands Amendment and Extension Ordinance 1851, an end was to be made of unauthorised squatting (Gardner 1956). According to Gardner (1956), henceforth:

- No person could depasture cattle upon or occupy the waste lands without a licence
- The Commissioner of Crown Lands could grant runs able to carry 25 000 sheep
- One head of 'great cattle' was reckoned to be equivalent to six sheep or 'small cattle'
- The annual licence fee was £5, and the licensee was to pay as well 'one pound for every thousand sheep above five thousand which the run shall be estimated as capable of containing'
- The licences were for 14 years, the run had to be stocked within 6 months or was subject to forfeiture, and the licensee was granted a pre-emptive right over 80 acres of his run as a homestead site, which he could purchase at the upset price of £1 an acre

3.3.4 Provincial Council rule

By 1853, after the colonising associations had been wound down and their duties assumed by provincial councils, land was sold by the Crown at £1 an acre, with higher prices in the former Wakefield settlements (Evison 1993). On 4 March 1853, Governor George Grey issued Waste Land Regulations authorising the sale of Crown 'waste land' outside the Canterbury and Otago Association Blocks, which included high-country land, at 10s and 5s an acre (Evison 1993). He was opposed to the land policies of the 'class settlements' of Otago and Canterbury, which he said sought, by their artificially high land prices of £2 and £3 an acre, to restrict access to land (Evison 1993). His aim, ostensibly, was to break the Wakefield system and to assist the small farmer onto the land, but in reality the new regulations helped to facilitate land monopoly. Those areas outside the Otago and Canterbury Blocks, such as South Canterbury, provided cheaper pastoral licences, lower annual rentals, compensation for improvements and pre-emptive (prior purchasing) rights. Consequently, pastoralists, including many from Australia, snapped up these areas (Condliffe 1959). Land aggregation dates from the passing of the regulations and the provincial legislation based on them

(Condliffe 1959). Speculators and pastoralists bought up large areas in the South Island (Condliffe 1959).

The Empowering Ordinance of 1853 gave provincial superintendents the authority to settle all local matters of administration as they saw fit (Hensley 1971). G.C. Hensley wrote that 'Although its substance had been recommended by Governor Grey in a circular to all the provincial governments, the Canterbury version certainly conferred rather wide powers on the Superintendent' (Hensley 1971: 24). He described the situation:

> 'The General Government at Auckland was in a state of unobstrusive chaos; it had no regular communications with the southern provinces, no legislature, no money, and even (after Grey's departure in December 1853) no Governor. In these circumstances it was useless to debate whether Canterbury's "seizure of power" was inadvisable or illegal. It was simply inevitable.' (Hensley 1971: 24)

Land was the core of provincial politics and finance. The provinces aimed to open up and settle waste lands, which were regarded as a source of funds for development (Hensley 1971). 'Hence the first and most pressing object of the Provincial Council's concern was to gain the control of its own waste lands' (Hensley 1971: 34).

3.3.5 Hapu and iwi response to the land purchases

Rivalry was intense among and within the various iwi and hapu as to who had the mana over different areas and the right to sell to the Europeans. Some Maori became hostile and threatening to leaseholders whom they believed were trespassing on their mahika kai and kaika nohoanga (Evison 1993). Evison wrote: 'Seeing that the conflicting tribal land claims in Te Wai Pounamu were something of a hornet's nest Grey handed the whole business over to Donald McLean, who he had put in charge of organizing a Native Land Purchase Department' (Evision 1993: 353).

Mclean, now Chief Crown Commissioner for the purchase of Native Lands, held fast to Grey's rule that no land could be bought in the northern half of the South Island without the consent of the conquering Ngati Toa chiefs. Hence, on 10 August 1853 at Wellington, McLean concluded with Ngati Toa the South Island purchase for £5000 (Evison 1993). Evison noted that:

> 'According to the Deed, Ngati Toa were acting "conjointly" with "Ngatiawa, Ngatikoata, Ngatirarua, Rangitane and Ngaitahu". £2,000 was paid to Ngati Toa at once, and the rest was to be paid later in instalments which Ngati Toa would share with the "conjoint" tribes.' (Evison 1993: 354)

Realising that the southern Murihiku chiefs were becoming impatient while waiting for their payment for the Murihiku purchase and beginning to deal directly with squatters who wanted land, Walter Mantell had his Murihiku Deed signed by the Otago chiefs at Dunedin a week later (Evison 1993). Mantell had been sent by Governor Grey in late 1851 to make the Murihiku purchase. This purchase was to include all the

South Island south of Kemp's and the Otago purchases. In February 1852, Mantell asked for Charles Kettle to survey the reserves and draw up the completed plans by May (Evison 1993). Kettle completed his work in April, when most Maori inhabitants of Murihiku were absent for the titi season. Out of the Murihiku Block of 7 million acres (2 835 000 ha), he allocated seven permanent Maori reserves amounting to 4875 acres (c. 974 ha), with an average size of 33 acres (c. 13.4 ha) per person (Evison 1993). This vast Murihiku Block, comprising the whole southwest portion of the South Island, from the Nuggets on the east coast to Milford Sound on the west, was purchased on 17 August 1853 for £2600 (Sorrenson 1990).

Evison wrote:

> 'Mantell had set up one section of Kai Tahu against another. By deferring to the Otago chiefs' *mana* in calling them to sign the deed first, he was now in a position to present the Murihiku Kai Tahu, who were his main potential opponents, with a *fait accompli*.'
>
> (Evison 1993: 356–357)

On 5 February 1857, disappointed that they had not received more money, land or reserves, the chiefs of Kai Tuahuriri signed the deed surrendering to the Queen their rights to North Canterbury for £200, and then a final £100 (Evison 1993). According to Evison:

> '... they decided to grasp at what they saw as their last chance of retrieving the one thing essential to their *mana* in North Canterbury—the acknowledgement by the Queen of their *rangatiratanga* over the block to be sold, which the signing of the deed would confirm.'
>
> (Evison 1993: 378)

3.3.6 Small farms and large runs

There were two classes of early European settlement: vast pastoral holdings (typically in the high country) and small holdings (often in the hill country or lowlands) where farmers took up seasonal and part-time employment elsewhere. Closer settlement was hampered by inadequate transport and the fact that cattle and sheep grazing were the only economically viable types of farming before refrigeration was invented (McLintock 1966).

The 'hundreds' were recommended by the Otago Provincial Council and proclaimed by the Governor of the colony. A 'hundred' was a block of arable land that could sustain 100 families and the system was based on a policy of dividing a large piece of agricultural land into small holdings of 50–200 acres (c. 20–80 ha). Land purchasers were obliged to spend a sum equal to 40 shillings per acre. On payment of an annual licence fee, owners were able to run stock on the unsold portions.

The first three hundreds for Otago were proclaimed in October 1854. They were called 'the Dunedin', 'the Tokomairiro' and 'the Clutha' (McLintock 1975).

3.3.7 The provincial system of land administration

Under the New Zealand Constitution Act 1852, the South Island was divided into the three provinces of Otago, Canterbury and Nelson. By late 1853, runholders had taken up the plains and foothills of Canterbury and Otago (Evison 1993). Marlborough was created in 1859, and Southland in 1861 (only to be re-absorbed by Otago in 1870) (Evison 1993).

By 1856, the provinces had effectively gained for themselves the right to legislate on and administer Crown lands. Pastoralists manoeuvred political and administrative institutions to advance their own interests. The 'Compact of 1856' recognised that the disposal of waste lands (that is, uncultivated lands, such as those in the high country) was a function of provincial councils (Condliffe 1959). By the end of 1856, it was abundantly clear that the future of Canterbury Province lay with runholding rather than agriculture. Whereas wool exports in 1855 had been valued at £20,000 compared with £22,000 for agricultural produce, in 1856 wool was worth £70,000 and agriculture £20,000 (Hensley 1971).

The Waste Lands Act 1858 set down the general conditions by which Crown lands could be dealt with by the provinces and, subject to the approval of the governor, virtual control was wrested away from central government by the provincial councils, which were dominated by pastoralists (Condliffe 1959). The price of land could now only be changed by the governor on the recommendation of the superintendent and provincial council (Condliffe 1959).

Setting up a run began by stating vague boundaries, paying rent and stocking with approved numbers (McAloon 2002). The Canterbury Provincial Council merely required that within 6 months on each run one sheep should be placed for every 20 acres (8.1 ha) (Scotter 1971). In 1856, J.B.A. Acland and C.G. Tripp took up 115 000 acres (c. 46 600 ha) between them at Mount Peel, but only purchased the 240-acre (c. 97-ha) homestead block (Scotter 1971). Some Amuri high-country runholders, in order to guard against predatory raids from rivals, took sections in the front (most fertile) sections, some protected the Hanmer River boundary, and others the Waiau River frontage (Gardner 1956). Further sections were acquired at a more leisurely pace, once the immediate threat had been reduced (Gardner 1956).

In Canterbury and Otago, in areas taken by the early associations, land was sold at the uniform price of £1 an acre in Otago and £2 an acre in Canterbury (Condliffe 1959). Outside these areas, pastoral leaseholders strove to maximise opportunities created by Grey's regulations of 1853 and the Waste Lands Act 1858 (Condliffe 1959). Each pastoral leaseholder could apply for a pre-emptive right over 250 acres (101.25 ha) around his homestead and 50 acres (20.25 ha) at the locations of significant improvements such as fences, out-stations and other buildings and plantations. Anybody else wanting to purchase this land had to deposit a tenth of the price for the entire section with his application, and the leaseholder had 1 month in which to exercise his prior right of purchase (Scotter 1971).

In the high country, as elsewhere, pre-emptive rights were used to secure desirable locations on runs: 50 acres (20.25 ha) for each shepherd's hut and 38½ chains (c. 850 m) of wire fencing (Condliffe 1959). Fences were erected near waterways, shepherds' huts constructed and occupied by 'dummies', sections useful to the runholder were enclosed or 'gridironed', and the best parts of the run were purchased or 'spotted' (Condliffe 1959). Pastoralists gradually took control of their extensive holdings with the minimum capital outlay (Condliffe 1959).

Although the Otago land regulations were revised in 1855 in an attempt to give security and protection to both agricultural and pastoral interests, the hundreds system was sabotaged by speculators who had no intention of spending 40 shillings an acre in improvements (Condliffe 1959). Assuming that popular agitation would eventually ensure a change in the law, they purchased and monopolised large areas of land (Condliffe 1959).

3.3.8 The Kaikoura and West Coast claims of Kai Tahu

In November 1858, Donald McLean appointed James Mackay Jr as an acting Land Purchase Commissioner, with instructions to settle Kai Tahu's Kaikoura and West Coast claims for £150 or £200 each (Evison 1993). Ngati Kuri asked for £10,000 in payment for their rights to the Kaikoura Block, and they wanted to keep the 150 000-acre (60 750-ha) block between the Tutaeputaputa (Conway) and Kahutara Rivers for their own sheep and cattle runs (Evison 1993). This block was already leased by three runholders. Ngati Kuri eventually accepted £300 and some small coastal reserves totalling c. 5625 acres (c. 2278 ha) for their claims (Evison 1993). The Kaikoura Purchase Deed was signed on 29 March 1859. The largest reserve at Waipapa and Mangamaunu was a long, precipitous coastal strip that Ngati Kuri wished to keep to provide access to seafood and fishing grounds, and because of the karaka groves. Although they, like other iwi and hapu, did not have sufficient land for runholding, their mana had been preserved because their tribal boundary was acknowledged to have extended from Te Parinuiowhiti inland to the headwaters of the Waiau-toa (Clarence River) above Rangitahi (Lake Tennyson), then along the mountain ranges to the Main Divide above Hokakura (Lake Sumner) (Evison 1993).

With 'great reluctance' and 'after weeks of argument', the West Coast chiefs signed the Arahura Deed on 21 May 1860 on behalf of the Kai Tahu tribe (Evison 1993: 388). Eight million acres (3 240 000 ha) passed to the Crown, for which the chiefs accepted a payment of £300 and 10 345 acres (c. 4190 ha) in reserves.

By 1859, Maori tribal title to land had been almost extinguished in the South Island, except for a few reserves still belonging to Maori (Evison 1993).

3.3.9 Leasehold, freehold and transience

In Canterbury during the 1860s, half the stations passed into other hands, some several times (Scotter 1971). After 1861, a dramatic increase in Canterbury land sales occurred, partly because of strong interest from Australian and British investors (Scotter 1971). By late 1866, over 500 000 acres (202 500 ha) had been freeholded in Canterbury Province, mostly on the lowlands (Scotter 1971). High-country land remained predominantly Crown pastoral leasehold, although there were pockets of freehold. Canterbury historian W.H. Scotter wrote:

> 'In the history of farming, land sales were more closely connected with the extension of agriculture than with pastoralism. Nevertheless rural land was bought for a variety of reasons: by runholders when their pre-emptive rights were challenged, by speculators securing land needed by runholders and therefore saleable at a profit, by land agents buying desirable freehold for resale on terms to farmers, and by farmers able to finance themselves.' (Scotter 1971: 206)

In the Amuri District, Kaikoura, by 1864 there was virtually no accessible Crown land worth purchasing on the plains and foothills to the western edge of the Hanmer Plain (Gardner 1956). Some runs still had large areas of leasehold land and these were often cut off by carefully selected freehold blocks; the Amuri high country was still Crown pastoral leasehold. Many of the leasehold runs changed hands rapidly as the harsh winters of the Amuri high country and pervasive scab took their toll on flocks and farmers (Gardner 1956).

There was a tacit acceptance by the populace and politicians up to the late 1860s that waste lands in general could not be put to use for a more profitable market than for wool and that, therefore, the squatter and his interests should be protected (Hearn 1971). Hence, up to this time, pastoralists wielded disproportionately powerful political influence. The system of pre-emptive rights came under heavy criticism during Canterbury's 1866 election campaign (Scotter 1971), and the Canterbury Waste Lands Act 1867 cracked that dominance by declaring that no further pre-emptive rights would be granted (although those already awarded under the 1856 regulations were validated) (Jourdain 1925).

3.3.10 The sheep scab scourge

Although the essential condition of retaining a depasturing licence was putting stock on a run, there was nothing in the regulations to stop a scabby sheep from counting as one head of 'small cattle' in stock returns. Consequently, all Amuri runs were infected to varying degrees by the end of the 1850s (Gardner 1956). By 1860, the runs were becoming overstocked and re-infection was more likely (Gardner 1956). Infected stragglers roamed the high country (Gardner 1956). The situation was aggravated during the gold rushes with the increased movement of stock (Gardner 1956). Sometimes, infected flocks were driven across runs without advance notice being given to the landholder.

By late 1863, scab was at its worst in Canterbury; 192 000 sheep were certified as unclean (Scotter 1971). From this time in Canterbury, strong measures were taken. The Provincial Council increased the number of inspectors to five, ordered the construction of sheep dips on all runs, many of which were in the high country, and increased fines (Scotter 1971).

The Nelson Pastoral Districts Fencing Act 1863 was passed to encourage fencing in the Amuri District, thus isolating scabby sheep and ground. It also gave legal means to coerce neighbours into fencing common boundaries. In 1864, Robert Heaton Rhodes of St Leonards aimed to have a ring fence around his run (Gardner 1956). Despite such precautions, travelling stock on the roads remained a potential menace. Rivers were relied on as 'a moat defensive' (Gardner 1956: 248). The Scab Act 1863, passed in conjunction with the Fencing Act, imposed a levy of a halfpence per head on sheep, and the money was used to pay inspectors (Gardner 1956). This Act was limited in its effect because it was only directed against the movement of scabby sheep, not scab itself (Gardner 1956). Although it made it compulsory to give notice before shifting sheep and provided for penalties of up to £100 against the owners of scabby sheep who let them wander onto clean runs, there were no fines for actually keeping scabby sheep on a run. Splits occurred on the Nelson Provincial Council between runholders who were sufficiently wealthy or energetic to stamp out the disease on their land, and those with fewer means or less resolve: 'The owners of clean flocks found their movements and their markets restricted by laws enacted against their scabby neighbours, and they demanded that the offenders should either clean up or get out' (Gardner 1956: 250).

The Nelson Scab Ordinance of 1865 could be used only when Amuri runholders gave their consent to its proclamation (Gardner 1956). Whereas the Canterbury Ordinance was mandatory, that of Nelson was permissive—the Provincial Council handed over to the district the power to decide whether or not to implement the drastic measures (Gardner 1956), and the owners of scabby runs who resisted were sufficiently powerful to stop the penal clauses being proclaimed (Gardner 1956). The situation changed during the late 1860s, when some 'scabby' runholders made more vigorous efforts to clean their flocks (Gardner 1956). By about 1870, the front country runs were clean while the higher country above the Waiau River was still infected (Gardner 1956). Up there, stray scabby sheep became lost in the half-burnt beech forest, and the owners of small high-country runs had neither the money nor the expertise to clean their flocks or to make a complete muster of their country (Gardner 1956).

3.3.11 The rabbit menace

At first, the multiplication of rabbits went unnoticed, but by the early 1870s numbers exploded (Hargreaves 1966). The financial returns of runholders declined, the quality of fleeces deteriorated, and the yields of wool dropped (Hargreaves 1966). Three rabbits were said to eat as much as one sheep (Hargreaves 1966). In 1873 in Kaikoura, where both inland and seaward high-country ranges were situated, runholders tried to organise a petition calling on the Provincial Government to declare rabbits as vermin and to find a way to raise money to get rid of them, but most smallholders:

> '... baulked at the idea of paying for measures which they felt certain would vastly benefit the squatters without proportional reward to themselves. This deep-rooted and enduring distrust killed any chance of a board being established when the Rabbit Nuisance Act 1876 provided the legal machinery for this to be done.'
>
> (Sherrard 1966: 188)

It would be 70 years before the first rabbit board, with jurisdiction between the Conway and Clarence Rivers (which embraced the Seaward Kaikoura Range) was constituted. As long as farmers were not legally coerced to eradicate rabbits, and as long as those who were trying to eradicate them could not agree on a uniform policy, the plague of rabbits continued to spread (Sherrard 1966). In 1875, more than 120 000 skins, 80 000 from Swyncombe, on the seaward high-country range, were shipped from Kaikoura (Sherrard 1966). Some groups argued that closer settlement would aid control of the pest, and consequently referred to the rabbit as 'the people's friend' (Hargreaves 1966). That sentiment was not sound financially, however. During this period, small farms were economically viable only on fertile, low country with access to markets (Hargreaves 1966).

3.3.12 The Native Land Court and Kai Tahu rights

Early in 1867, several Kai Tahu applied to the Native Land Court to have their individual rights of succession in their Maori reserves certified. Soon other Kai Tahu lodged claims for mahika kai and parts of Kemp's Block that they considered had never been sold to Kemp (Evison 1993).

On 20 April 1868, the first Native Land Court to be held in the South Island opened in Christchurch before Chief Judge Fenton. The results of the various cases were complex, but when Fenton gave his judgement he said that he was prepared to award Kai Tahu such pieces of land and fishing easements as were agreed to by the Crown, to bring their average up from 10 acres (4.05 ha) to 14 acres (5.67 ha) per head (Evison 1993).

In Dunedin, beginning on 14 May 1868, the Native Land Court heard another series of Maori claims concerning rights of succession and disputes over reserve rights (Evison 1993). After hearing and adjudicating on several individual cases, Fenton applied the Order of Reference in Otago as he had done in Canterbury (Evison 1993). Claimants under

Kemp's Deed were awarded land to bring their average up to 14 acres a head, and 2100 acres (850.5 ha) was awarded in Otago (Evison 1993). Although Chief Judge Fenton's awards provided for an increase in the allocation of land to Kai Tahu, for some time this was only in theory because the Court had no power to compel the provincial governments to allocate this land promptly (Evison 1993).

In the high country, the destruction of mahika kai continued as pastoralism expanded (Evison 1993). Burning off, roading, drainage and diversion of streams for water power contributed to their disappearance. The clash between Te Maiharoa and local runholders and the Crown near Omarama was a flash point of Maori frustration and grievance at the loss of their high-country mahika kai that they never believed had been sold to Kemp (McIntyre 2005).

Mackay recalled that as early as 1847, in a dispatch to Secretary of State for the Colonies Earl Grey, Governor George Grey had emphasised the importance of uncultivated lands to Maori, including those in the high country, when he pointed out that:

> 'The Natives do not support themselves solely by cultivation, but from fern-root, from fishing, from eel-ponds, from catching birds, from hunting wild pigs (for which they require extensive runs), and by such-like pursuits: "To deprive them of their wild lands, and to limit them to land for the purpose of cultivation, is in fact, to cut them off from some of the most important means of subsistence".'
>
> (Grey 1847, cited in Mackay 1891: 2)

3.3.13 Overview

In Canterbury between 1858 and 1867, the total number of sheep rose from fewer than 500 000 to 2 500 000 (Scotter 1971). By 1865, there were several large flocks. For example, in that same year, W.B. and R.H. Rhodes sold the Levels Run with 82 000 sheep on it (Scotter 1971). During 1867, 11 million pounds (c. 5 million kg) of wool worth £627,678 was exported (Scotter 1971). Until the 1870s, almost all the sheep on the runs were merinos (Scotter 1971).

By 1857, 3 300 000 acres (1 36 500 ha) of Canterbury land were held by pastoral lease, of which 700 000 acres (283 500 ha) were under general government regulations (Scotter 1971). Around 750 000 acres (303 750 ha) were added that year under provincial regulations as new high-country runs were taken up and established sheep farmers expanded their holdings (Scotter 1971). By 1860, almost all the sheep country in Canterbury had been taken up.

The demand for sheep almost ceased as new runholders satisfied their stocking requirements (Scotter 1971). A steady decline in the price of wool continued throughout the decade to 1870. Many high-country runholders began to realise that their costs were too onerous and that they had borrowed too much money (Scotter 1971).

By 1870, Kai Tahu, with reserves mainly in small holdings of 14 acres (5.67 ha) or fewer, obtained work in the new economy as shearers

and labourers (Evison 1993). The small pieces of land that Chief Judge Fenton had awarded in 'final satisfaction' of their claims had not yet been allocated by the provincial authorities (Evison 1993: 434). Kai Tahu increasingly began to lease their land to Europeans because the areas they had been allocated earlier were too small, poor or isolated to farm as economic units (Evison 1993).

3.4 SUMMARY

3.4.1 General historical features

- Transfer of most South Island land from Maori to European ownership
- Widespread destruction of mahika kai and kaika nohoanga
- Exploitation mostly of existing natural resources, but Europeans also began to introduce exotic plant species to improve pasture
- Small-scale 'Native Reserves' were established
- Large-scale grazing of sheep and cattle and amalgamation of land by Europeans developed mainly on tussock lands
- Stock numbers increased through extension of pasturage for grazing
- Mainly wool produced (little use of meat)
- Construction of homesteads and other station buildings from materials available nearby
- Near self-sufficiency on the land
- Establishment of Crown pastoral leasehold lands on both low- and high-country areas
- Provincial government land administration led to land legislation in the different provinces becoming confusing and inconsistent
- Transport and communications poor
- Animal pests, such as rabbits, and exotic plant species, such as gorse, invaded
- Scab spread rapidly, with increasingly stringent legislation to control it, but provincial variations undermined these efforts
- Fencing was absent or limited at first, but became more widespread from the late 1860s
- Mining, especially for gold, quarrying and sawmilling

3.4.2 Key physical resources

- Early high-country homesteads, woolsheds, stock yards and other buildings
- Constructions of local natural material: stone, clay and timber
- Early manufacturing and quarrying for construction; bricks, pre-cut timber and limestone
- Some early grand houses
- Extraction of materials, such as peat and timber, for fuel marked the landscape
- Shepherds', musterers' and boundary keepers' huts
- Early fences, including post-and-rail, ditch-and-bank, stone and then heavy gauge wire
- Early historic trees, shelter belts, orchards or plantations
- Washing pens, dipping casks, tanks and troughs, boilers, old dipping solutions and/or their containers, draining stages, and sites of early tobacco plantations
- Boiling down plants (slaughter houses, vats, boilers, troughs and tramways)
- Mines, quarries and sawmills
- Water races for mining converted to irrigation ditches
- Early bullock tracks, bridal trails or pack tracks
- Fords, ferry crossings and early bridges
- Accommodation houses
- Stock reserves and droving routes
- Sledges, drays and wagons
- Early railway lines
- Presses for processing rabbit skins and zinc-lined cases for transport

4. 1870s–1880s: Development and degradation

4.1 LANDSCAPE MODIFICATION

4.1.1 Rabbits

From the 1870s, rabbits became a scourge in Otago, Southland and Marlborough. Beattie noted that the hills at Wantwood Run in 1877 were 'moving with rabbits; sheep had no hope of thriving, as the rabbits devoured all the feed' (Beattie 1947: 32). Over 100 rabbiters with guns were employed, and they earned twopence per skin (Beattie 1947). By 1881, rabbit numbers were increasing alarmingly at Morven Hills and Benmore Stations in northern Otago (Pinney 1981). Benmore hired three professional rabbiters. At first, no poison was laid for fear of destroying the weka, but by October ferrets could be found all over the station (apparently after two had escaped), and they began slaughtering the birds (Pinney 1981). Soon cats were released as well, and in 1885, 7 stoats and then 25 weasels were let loose in the district (Pinney 1981). Despite the laying of poison at Benmore from around 1883, rabbits were rampant by 1886 (Pinney 1981). That year, 3535 pounds (c. 1603 kg) of dry oats were laid with 50 pounds (c. 23 kg) of phosphorous. By 1888, 687 ferrets had been let loose. Between September 1888 and April 1889, 71 403 rabbit skins were counted, and in May 1890 four poison gangs were hired (Pinney 1981).

In the 1880s, rabbits invaded Canterbury from the north and south (Holland et al. 2002). There, as elsewhere, they caused serious erosion and soil depletion by eating pasture and digging up tussocks. Rough, high-country land provided ideal breeding grounds for them. This depredation, in combination with burning off, turned vast areas of the high country into barren waste land. There was an alarming decline in the acreage and nutritional value of Crown pastoral leasehold grasslands (Holland et al. 2002). In 1887, Otago Province lost £32,803 in rental income when tenants abandoned 414 000 acres (167 670 ha) of former grazing land (Holland et al. 2002). During this time, through the 1880s, droughts increased in Marlborough, Canterbury and Otago (Brooking 1996). Stock numbers fell dramatically (Holland et al. 2002).

By 1883, the rabbit plague was costing the colony c. £1.7 million a year, and Central Government introduced thousands of stoats, ferrets and weasels (Grey 1994). These did not solve the problem. Rather, these introduced feral creatures killed New Zealand's flightless birds as well as rabbits (Grey 1994).

4.1.2 The impact of refrigeration

The advent of refrigeration in the 1880s was a turning point. The frozen meat industry demanded breeds of sheep different from the merino (Hatch 1992), which was bred mainly for wool. From the 1880s, sheep were crossbred to yield both meat and wool (Hatch 1992). Different breeds were suited to different areas. For example, in the Mackenzie Country, merino and Romney were farmed as they suited the altitudes of the high country (Hatch 1992). Leaseholders sowed permanent pasture, which meant that sheep runs could be much smaller because permanent pasture fed many more sheep per acre and each sheep, producing both meat and wool, earned more income (Hatch 1992). Meanwhile, more labour-intensive methods were employed and more fences were built (Hatch 1992). Beforehand, sheep had been moved only a few times a year, but from this time they were moved from paddock to paddock to gain the greatest possible nutrition from the grasses (Hatch 1992). Supplementary winter feed (usually turnips or swedes) was grown because pasture grasses grew slowly in winter (Hatch 1992).

4.1.3 Acclimatisation of exotic plant species

Exotic grasses and the new breeds of sheep thrived only at lower altitudes in the high country, while at higher altitudes runholding continued almost unchanged (Hatch 1992). Whereas in Canterbury and Otago Provinces smaller sheep farms evolved on the alluvial shelf between the coast, lower valleys and foothills, taking advantage of the new exotic pasture plants and sheep breeds, sheep runs continued to dominate on the higher foothills, lower mountains and higher valleys of the Central Otago and South Canterbury high country (Hatch 1992).

New Zealand's native grasslands had by now been irrevocably altered by decades of human intervention. With the introduction of exotic flora and fauna, there was no turning back the clock. In the high country, species such as rabbits, gorse and thistles became invasive (Dominy 2001). Because of the shortage and high cost of labour, little was done to eradicate these pests (Hargreaves 1966). If pastoral land was taken out of production, ecological chaos would ensue (Dominy 2001).

4.1.4 Dividing the landscape

In Canterbury in 1878, the greatest area of pastoral land was in Geraldine County (1 250 000 acres; 506 250 ha), mostly in the Mackenzie Country (Scotter 1965). In 1883, the Mackenzie Plateau was made into a separate county (Scotter 1965). In the 1 050 000 acres (425 250 ha) of Amuri County, only 1% of the farms were less than 5000 acres (2025 ha): 15 workmen's holdings and seven other freehold properties (Scotter 1965). Most of the freehold land was divided into 19 runs of over 5000 acres; 400 000 acres (162 000 ha) were still Crown pastoral leasehold land (Scotter 1965). The entire Cheviot area was divided into three great freeholds averaging more than 60 000 acres (24 300 ha) in

size, with 137 000 sheep. In Ashley County, the area of pastoral leasehold land exceeded that of freehold land, and the great runs consisted of land under both tenures.

In the 1870s, Ashburton County was still characterised by great empty expanses: the mountains, upland basins and plains were devoid of plantations of exotic trees (Scotter 1965). However, more land (454 000 acres; 183 870 ha) had been bought here than in any other county, and all types of farms could be found (Scotter 1965).

Geraldine had the greatest number of sheep (over 800 000), but Ashley, Selwyn and Ashburton all had over 600 000 (Scotter 1965).

4.2 PHYSICAL REMAINS

4.2.1 Fencing

By the 1870s, wire fencing was expanding rapidly after the introduction of lighter, cheaper No. 8 spun wire in the late 1860s. Fencing throughout Ashburton County was fairly evenly divided between wire and earlier materials. Because of the cost of wire fencing, farmers were still building sod walls, and over 200 of the 1000 houses were of sod construction (Scotter 1965). In Amuri and Cheviot, almost all the fencing was made of wire (Scotter 1965).

The significance of this technological development cannot be underestimated (Hargreaves 1965). The era of exploitative grazing was coming to an end. With increasingly intense subdivision and use of land, farmers needed to curb the spread of scab, cull their sheep, reduce the number of shepherds and replenish the soil to maintain profitability (Hargreaves 1965). The new fencing wire enabled them to do so (Hargreaves 1965). In the high country, snow fences increasingly traced high-country contours, and were often continuations of natural features, such as creeks or ridges (Dominy 2001).

4.2.2 Homesteads and other station buildings

Homesteads on large high-country estates became bigger and grander, and were frequently made of imported materials (Dominy 2001) (Fig. 12). Their surroundings, too, became lavish. In 1886, John Rutherford's estate at Opawa on the upper Hakataramea River had 25 acres (c. 10 ha) of grounds, half of which were trees and the rest gardens and fishponds. Janet Holm wrote that the 'grass tennis court and a bowling green were surrounded by other lawns set with twelve fishponds, connected by miniature waterfalls and full of perch, trout and enormous goldfish' (Holm 1992: 74).

The most common station configuration was one of encompassment, with boundaries within boundaries and the homestead at the centre (Dominy 2001). Spatial divisions were symbolic of the social order. For example, at Double Hill Station, which was taken up in 1858, the original cob cottage homestead was built at the hub. Two other cottages were

Figure 12. Grasmere Station, 1872, a typical high-country homestead of the era, with a post-and-rail fence across the middle foreground. *Photo courtesy of the Alexander Turnbull Library, Wellington, New Zealand (reference number 32235 ¼).*

subsequently built, with the new frame homestead being constructed around the third. The homestead was positioned in the central cluster of buildings, with outlying station workers' buildings a suitable distance away and apart. The woolshed was built in 1882, with pit-sawn beams, hand-cut rails and no nails. It had 22 stands for the shearers. The first shearers' quarters and stables were built of cob around the same time (Dominy 2001).

4.2.3 Rabbit containment and destruction

Methods used to curb the spread of rabbits were shooting; distributing poisoned (usually phosphorised) wheat, oats and carrots; plugging burrows; closing water runs; fumigating warrens with carbon disulphide; releasing dogs, stoats, weasels, ferrets and cats; and erecting rabbit-proof fences (Beattie 1947; Holland et al. 2002).

Canterbury was threatened by rabbits from the north and the south. Since 1882, there had been an explosion of rabbits in Marlborough, and by 1886 they were invading Canterbury in force (Scotter 1965). Rabbiters' huts mushroomed throughout the province (Scotter 1965). Under the Rabbit Act 1886, two districts north and south of the Waiau River were gazetted under the control of the North Amuri and the Hurunui Rabbit Boards, respectively (Scotter 1965). In 1886 and 1887, there was a disturbing rise in the number of rabbits in the Amuri District north of the Waiau River. Rabbits invaded from Tarndale via the upper Clarence River and swarmed over St James and St Helens Stations, mainly because the Bank of New Zealand in January 1886 had abandoned the Clarence runs when mortgagers gave them up, leaving the land unprotected (Gardner 1956). As with the scab epidemic, the Waiau River divided the Amuri District and protected the southern half (Gardner 1956). In January 1887, the Hurunui Rabbit District between the Waipara and Waiau

Rivers was proclaimed, and in March the Amuri Rabbit District comprised the rest of the Cheviot and Amuri Counties north of the river (except for Leslie Hills). In northern Amuri, runholders were encouraged to use stoats, ferrets, weasels and cats to control rabbits (Gardner 1956). (The district would eventually be abolished in 1891 because it was ineffective in keeping down rabbit numbers.)

The southern Hurunui area was almost free of rabbits, and the Hurunui Board endeavoured to keep it that way by no longer relying on the Waiau River itself to protect the Hurunui Rabbit District against rabbits from the north (Amuri): it constructed a rabbit-proof fence along the river in 1887 (Scotter 1965).

The fence ran along the south bank of the Waiau River from the sea to Mouse Point, and from the upper Waiau Bridge across Jacks Pass to the Clarence River and on to Lake Tennyson, over Maling Pass and into the headwaters of the Waiau River (Gardner 1956; Ian Hill, DOC, pers. comm.) (Fig. 13). Sheep owners were rated at a penny an animal to pay for it. Between the river and the fence, a narrow piece of land was left, which could be easily patrolled. Completed in 1889, the fence was over 78 miles (c. 125.5 km) long and constructed of materials drayed and packed from Culverden and Port Robinson. Although the Hurunui Rabbit Board hired ten rabbiters, the pests still got through the flood gates, across the snow-buried line in winter, and through the exposed west flank (Gardner 1956). Stock owners to the south of the Waiau line were losing confidence in the efficacy of the fence by 1890 (Scotter 1965).

Realising that one line could not provide adequate protection, runholders on Balmoral and other stations erected private fences through the 1880s and 1890s (Gardner 1956) (Fig. 14). Despite these measures, flood gates and road gates gave rabbits access to runs, and the numerous

Figure 13. Aerial oblique of the landscape setting of the rabbit-proof fence by the outlet to Lake Tennyson. Rabbits that managed to cross the river were caught behind the fence and exterminated in the course of regular patrols by rabbiters. *Photo courtesy of Kevin L. Jones, DOC.*

Figure 14. Dismantled rabbit-proof fence, showing detail of the strainer post and recovered rolls of wire at Saxton Pass, Molesworth. *Photo courtesy of Kevin L. Jones, DOC.*

government reserves and vast stretches of unoccupied high-country Crown lands in Amuri District attracted them in droves (Gardner 1956). In 1892, runholders south of the Hurunui built another fence along that river (Scotter 1965). The Rutherfords and other runholders ring-fenced their land (Scotter 1965). However, rabbit-proof fences were expensive and difficult to repair, and the rabbits had usually already infested an area that runholders or rabbit boards had decided was to be cordoned off (Nightingale 1992).

In Canterbury, methods of containment and destruction were thought to be keeping the brown rabbits under control. Silver grey rabbits from the north and wild rabbits from Otago were more invasive (Scotter 1965). A rabbit-proof fence, which stretched for 40 miles (c. 64 km) down the Tasman Valley from the Mueller Glacier and another 40 miles across to Hakataramea, was built by 1888 (Scotter 1965). Although rabbit-proof fences previously erected in Otago had not been successful (Scotter 1965), this one was stronger, had traps attached to it and was inspected each day. It worked, but rabbits on the other side multiplied. In 1892, over 40 000 rabbits were killed between the Tekapo and Pukaki Rivers (Scotter 1965).

4.2.4 Transportation, accommodation and communication

In the early 1880s, the Waiau River, the most dangerous river in northern Canterbury, was still being forded on the main road near the coast (Gardner 1956). Many travellers had drowned there (Gardner 1956). The river was also hazardous to stock being driven to or from the high country. For example, in May 1878, a flock of 3600 sheep had taken 4 days to be swum across. Some drowned and some had to be taken across in a cart. Built between 1882 and 1884, the Waiau Bridge was made up of 45 spans and was 1776 feet (c. 541 m) long (Gardner 1956). It was still standing in the 1950s. The Arthur's Ferry Bridge, in the high country, was completed in 1887. Designed by John Blackett, the structure rested on two inverted triangular frames, was 255 feet (c. 78 m) long, 101 feet (c. 31 m) above the river, and was also still in use in the 1950s (Gardner 1956). While building the Arthur's Ferry Bridge, Andersons, engineers of Christchurch, simultaneously constructed the stock bridge over the Hope River at Glynn Wye for Duncan Rutherford (Gardner 1956). Completed in 1885, the bridge, which was suspended on steel cables, had one span of 247 feet (c. 75 m). This was also still standing in the 1950s (Gardner 1956). North of Kaikoura, the coastal bridge across the

Clarence River was not completed until 1887. The iron and timber was landed by punt at Waipapa and then hauled 4 miles (c. 6.4 km) to the river by bullock teams. Designed to carry both road and rail traffic, the bridge had four spans of 120 feet (c. 36.6 m) and another of 80 feet (c. 24.4 m) and rested on four pairs of huge iron cylinders sunk into the bed of the river (Gardner 1956).

Coach services began in Kaikoura County in the 1880s, as the roads went through. Sometimes, bullock tracks were followed on unfinished sections and horses were provided at the end of roads for continuing the journey along bridle tracks (Sherrard 1966). The telegraph was extended to Waiau in 1872 (Gardner 1956).

Canterbury experienced a surge in railway construction during the 1870s and 1880s (Fig. 15). A branch railway line, 10 miles (c. 16 km) long, was built between the Hurunui River and the south bank of the Waiau River (Gardner 1956). The Hurunui railway bridge was built between 1883 and 1886, and the line to Culverden opened officially in 1886 (Gardner 1956) (Fig. 15).

4.2.5 Tourism

Tourism in the South Island high country was at first hindered by the inaccessibility of the terrain (Grey 1994). Interest centred on Mount Cook, the eastern piedmont lakes and the southwestern sounds (Grey 1994). Tourist ventures in the 1880s were initially dependent on an erratic pre-existing network of bullock tracks, and their development helped pastoralism to penetrate further into mountainous territory (Ian Hill, DOC, pers. comm. 2003).

All the main rivers in Canterbury had ferries by the mid-1860s and, wherever possible, accommodation houses had been located at these river crossings. Today, few exist, although some of the sites have had more modern hotels built on them. In 2000, archaeologist Chris Jacomb conducted a site investigation of the Pukaki Inn, which was the only known remaining accommodation house site in the Mackenzie Basin (Jacomb 2000).

Europeans had begun to settle in the Mackenzie Basin in 1855, and in 1858, on the recommendation of the Canterbury Provincial Council, construction of a dray track began there (Jacomb 2000). In 1862, the Provincial Secretary called for tenders for the establishment of ferries over the Tekapo, Pukaki and Ohau Rivers where the rivers were crossed by dray tracks in the Mount Cook area (Andersen 1916). Terms included in the lease of the ferry reserves on either side of the stream were that the successful tenderer was to erect a house, provide sufficient oats at eightpence per imperial quart, a safe ferry boat and shelter for stock. Timber could be cut for construction and fuel, and reserves could be set aside for this reason (Andersen 1916).

Jacomb found 'that the tender issued in 1862 for a ferry at Pukaki was not filled and that the first official ferry was established in 1876' (Jacomb 2000: 49). Records show that in February 1876 two large boats left Timaru for the Pukaki ferry, and in April George Tait was appointed

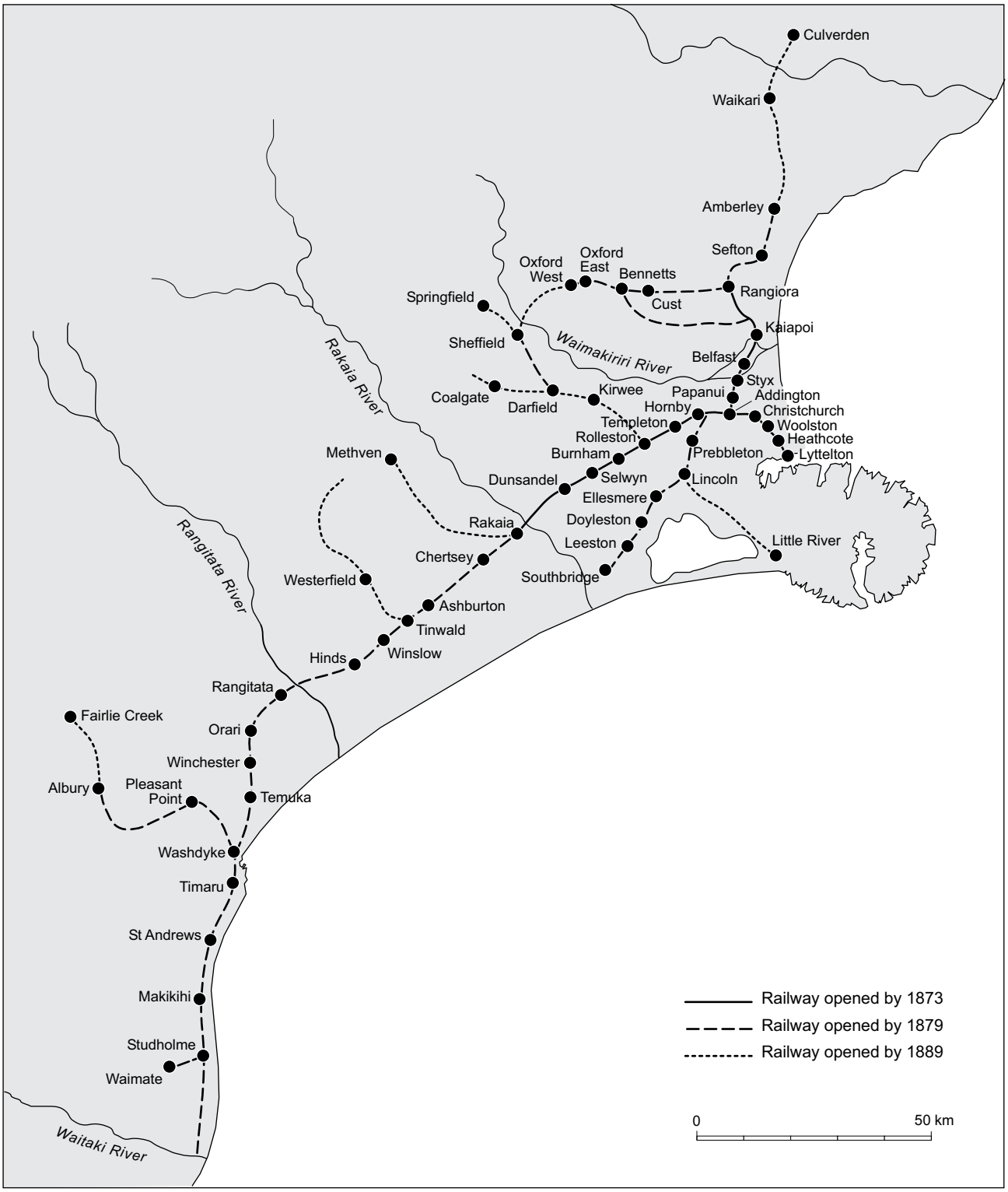

Figure 15. Railways that opened in Canterbury during the 1870s and 1880s, after Cant & Kirkpatrick (2001).

ferryman (Andersen 1916). In the early 1890s, the ferry and hotel were moved closer to the outlet of Lake Pukaki, c. 3 miles (c. 4.8 km) upstream, and the ferry was replaced by a bridge in 1895 (Jacomb 2000). The original accommodation house site was partially destroyed by controlled spilling by hydroelectric plants and bulldozing in the late 20th century (Jacomb 2000). The main features of the Pukaki Inn site are a concrete chimney, which belonged to the accommodation house, the remains of a forge, the remains possibly of a third building, and a boulder-lined dray track (Jacomb 2000).

These provincial council initiatives boosted pastoralism and its expansion in the district. For example, Birch Hill high-country station near Mount Cook was first occupied by the Sicilian Nicolo (Big Mick) Radove in 1868 (Jacomb 2002). Jacomb also conducted a survey of the physical remains at Birch Hill, and recorded the sites of three homesteads, one woolshed, two ditch-and-bank enclosures, two graves, a sheep yard, a bivvy and a possible forge (Jacomb 2002). A rabbit fence still separated Birch Hill from the next station down the Tasman River, Glentanner. This was runholding on the margins of possibility. Jacomb wrote: 'The story of Birch Hill is a story of hardship and struggle, life and death in a difficult, remote environment' (Jacomb 2002: 33). The run changed hands several times and was eventually reclaimed by the wild when it became part of the Mount Cook National Park (Jacomb 2002).

An early clash occurred between environmentalists and pastoralists when, in 1884, a petition was sent to Government complaining of the destruction of native vegetation there by burning off and grazing (Wigley 1979). A ranger was appointed for the Mount Cook area in response. His name was M.C. (Frank) Huddlestone of Timaru, a surveyor and watercolourist (Wigley 1979). He soon became interested in establishing some tourist accommodation, and purchased c. 30 acres (c. 12 ha) of land near the base of Mueller Glacier (Wigley 1979). The first Hermitage hotel, believed to have been a small cob building, was built. In 1885, Huddlestone sold his land to the Mount Cook-Hermitage Company, which was set up to develop a Swiss-style alpine village, and he became the first manager (Wigley 1979).

This company ran its own coach service between Fairlie and The Hermitage. Vehicles included a brake that could carry 16 passengers, and two 12-passenger coaches (Wigley 1979). Another firm, McLeod and Rossiter, set up in competition in 1888, with four covered-in coaches, four wagonettes, and several buggies and gigs (Wigley 1979). It took a visitor 3 days to travel from Timaru to Mount Cook. The first day was spent travelling by train from Timaru to Fairlie, the second by coach from Fairlie to Pukaki, and the third by coach to The Hermitage (Wigley 1979).

On the Mackenzie Plains, the coaches followed the zigzag bullock tracks. These were not metalled, and during the spring thaw they became extremely muddy (Wigley 1979). In the summer, the same tracks were very dusty. As the years went by, they sank, until they were 3 feet (c. 0.9 m) or more below the surrounding ground and only a little more

than the width of the vehicles (Wigley 1979). Between Lake Pukaki and The Hermitage, after rain or snow, the track was frequently gouged out by water cascading off the mountain slopes, and sometimes travellers were forced to ford 20 or 30 streams (Wigley 1979).

The Acheron accommodation house (Fig. 16) was a key stopping point on the routes from Nelson and Marlborough to Canterbury via Jollies Pass. The first Tarndale accommodation house (Fig. 17) was an important stopping point from the Rainbow valley (Nelson) to the Acheron River (Nelson) and the routes to Marlborough and Canterbury. The Jollies Pass accommodation house was the hub of the Hanmer district, Amuri, for the 65 years of its existence (Jacomb 2000). Nearby, Hanmer developed as a tourist and health resort because of its hot pools (Jacomb 2000). The

Figure 16. Aerial oblique of the Acheron accommodation house in its setting by the Acheron River. *Photo courtesy of Kevin L. Jones, DOC.*

Figure 17. Aerial oblique of the Tarndale area, showing the site of the first Tarndale accommodation house. This was located on the terrace edge at centre. The distant valley (above centre) is Travellers Valley leading to the Saxton and Ward Passes and the Awatere, and also to the upper reaches of the Acheron River. View to the east. *Photo courtesy of Kevin L. Jones, DOC.*

Government reserved 2560 acres (c. 1037 ha) around the springs by 1881, and began to build baths and enclosures. Extensive reserves were marked out at Mount Cook in 1885 and at Arthur's Pass in 1901, and these were to form the kernel of future national parks (Pawson 2001).

In the fiords and glacial lakes of the southwest of the South Island, early runholders provided accommodation for infrequent visitors to Lakes Te Anau and Manapouri (Grey 1994). After the Union Steam Ship Company started summer cruises in 1876, and the railway arrived at Lumsden in 1876 and Mossburn in 1887, more tourists arrived (Grey 1994). The Te Anau/Milford Sound pass was discovered in 1888, and by the 1890s, the Milford Track had become a major sightseeing attraction (Grey 1994). In 1904, 2 326 200 acres (942 111 ha) of the Fiordland district were reserved as a national park, and red deer were released at Manapouri, wapati and moose at Dusky Sound, and trout and salmon at Te Anau in a bid to make the region more enticing to visitors (Grey 1994). However, the area still did not attract as many tourists as Lake Wakatipu or Mount Cook because of its remoteness (Grey 1994). Road traffic would not reach Milford Sound until 1953, when the Homer Tunnel was completed (Grey 1994).

4.2.6 Mining

Mining was to be important to the New Zealand economy until 1921 (Hearn 2002). Minerals extracted from the high country included metals (mostly gold), non-metals (limestone, clays and aggregates) and fuel (especially coal). Between 1861 and 1865, the industry generated 65.2% of New Zealand's export earnings (Hearn 2002). (This declined to 15.3% between 1901 and 1905, and then to 3.2% from 1915 to 1920.) Gold accounted for more than 90% and coal 5.2% by value of mineral exports between 1853 and 1921 (Hearn 2002). Unlike the resources of the pastoral industry, which had the potential to be made sustainable, those of the mining industry were finite.

Jill Hamel (2001) provided detailed descriptions of the different sites and types of gold mining. She noted that:

> 'The great alluvial fields of Otago were at Waipori (ground sluicing and dredging), Gabriels Gully/Tuapeka (hydraulic elevating and tunnelling), Roxburgh/Fruitlands (hydraulic elevating and dredging), the Clutha terraces from Alexandra to Luggate (ground sluicing and dredging), Bannockburn (hydraulic sluicing and tunnelling), the lower Nevis (hydraulic elevating and dredging), Naseby (hydraulic sluicing), upper Manuherikia (hydraulic elevating), Arrow River (ground sluicing), and the Shotover River (hydraulic sluicing and dredging). There were also some interesting fields at high elevations where old sediments had been trapped in small faulted pockets, such as at the Griffel, Pisa Range, and Potters No.2, Old Man Range, or linear fields where the head waters of streams run along the tops of the ranges, such as in the Roaring Meg and Upper Fraser River. Many of these fields were worked over a long period from the mid 1860s to about 1910.'
>
> (Hamel 2001: 132)

Another Otago archaeologist, Peter Bristow (1998), gave a detailed description of the technological changes in alluvial mining at Earnscleugh on the Clutha River from 1863 to 1963. DOC's (1999) visitor information brochure for the site stated that:

> 'The Earnscleugh tailings area has great historic significance, representing the evolution of dredging from the early 1860s through to the 1960s. The extent and preservation of the tailings display the sequence of technological advancement through 100 years of gold dredging in this area.' (DOC 1999)

Ground sluicing left behind the classical herringbone pattern of early mining.

Quartz (or hard rock) mining began in Otago in about 1863 (Hamel 2001) and continues to the present. Some sites were in remote high-country locations, such as the Skippers and Dart Valleys. Notable quartz mines were found at Glenorchy, Bullendale, Macetown, Carrick, Bendigo, Oturehura and Macraes Flat. Hamel informed us that:

> 'Archaeologically an old battery site will consist of at least two platforms, generally cut into rock, often with concrete block foundations set with bolts for the heavy machinery. On a lower level there may be the foundations or remains of cyanide tanks. Along with a race and a reservoir, set slightly above the battery, these are the usual archaeological indications of 19th century quartz mining activity. Some early mines may have no associated battery because the ore was taken by dray to distant battery, or even shipped to Australia for processing.' (Hamel 2001: 165)

Crushing had begun at Bullendale by 1864, and a hydroelectric plant was constructed to drive the machinery in 1886 (Hamel 2001). The main period of active mining at Macetown was from 1876 to 1886 (Hamel 2001). The Invincible Lode high on a hillside in the Rees Valley was worked successfully between 1882 and 1889 (Hamel 2001). At Bendigo Creek, after the initial alluvial mining from 1862 to 1866, quartz mining began in 1868 and continued until the early 20th century (Hamel 2001). Quartz mining had begun near Macraes Flat by May 1866 (Hamel 2001). Over time, the remains of this 'Duke of Edinburgh' mine have been eroded by ploughing, roading and the dumping of rubbish. The battery and mine buildings have disappeared. The reservoir and a crumbling stone house with sod-walled enclosures were still there in 2001. The Carrick Field, established in 1870, ran up the mountainside from c. 1800 to c. 3180 feet (c. 550–970 m) above sea level (Hamel 2001). Quartzville, at the base of the main spur, was a packers' town, where loads were transferred from drays to packhorses for the steep haul up to the mines. However, little remained; house ruins, battery platforms and pieces of machinery could be seen higher on the spur or along the gullies. At the top of the range there was a huge iron waterwheel, and the long Carrick water race constructed to provide water to the waterwheel and to Bannockburn ran around the hillside (Hamel 2001).

4.2.7 Scheelite mining

Most of the lodes in the Glenorchy goldfield carried more scheelite than gold, and the largest and most productive were those on the Glenorchy-Kelly Lodes on Mount Judah (Hamel 2001). These were worked between the 1880s and 1977 (Hamel 2001).

4.2.8 Coal mining and sawmilling

Open-cast coal mining was carried out on a very small scale at Mount Somers in Canterbury, Mataura and Nightcaps in Southland, and in Central Otago, with little pits being used and abandoned as demand fluctuated (Hearn 2002).

At Gabriels Gully, a sawmill operated for a time in the beech forest on the spur for construction on the goldfields, but when the trees had gone, the diggers themselves were forced to search for swiftly vanishing scrub (Salmon 1963). In West Otago, the first small communities were reliant on sawmilling and sheep (Olssen 1984). The great wave of miners into the barren landscape of Central Otago, on the other side of the Old Man Range/Kopuwai, created a strong demand for timber (Olssen 1984). Soon, steam mills were constructed on the Pomahaka River and by 1870 the three largest mills were manufacturing c. 100 000 feet (c. 30 500 m) per week (Olssen 1984). Around 100 bullock teams took the timber to the different markets (Olssen 1984). Many small businesses, such as blacksmiths, pubs and general stores, sprang up. At Tapanui there were two small coal mines (Olssen 1984).

4.3 LAND TENURE

4.3.1 Mining and pastoralism

Provincial governments wished to retain possession of potentially gold-bearing land, much of which was in the high country. Some resolved this issue by writing into their land regulations special clauses for leasing lands in the goldfields (McDonald 1945). These leases were to be cancelled when a goldfield was proclaimed. For example, James Chapman Smith and John Martin had a licence for the 12 800-acre (5184-ha) Run 53 in Otago when, in May 1861, Gabriel Read discovered gold there (McIntyre 2002). This run was officially declared a goldfield, the partners' depasturing licence was cancelled, and they were given £1216 compensation by the Government. Both men went on to make a fortune, not by mining but by slaughtering their sheep for the instant local market and transporting the miners' gold to the banks in Dunedin (McIntyre 2002).

In Otago, the mining industry generated four key types of conflict:

- Prospectors and miners gaining easy access to land versus landholders protecting their property rights and interests
- Miners using natural watercourses for discharging tailings, polluted water and other debris versus settlers demanding that their riparian rights be protected

- The exploitation of mineral wealth versus the preservation of the pastoral or agricultural value of the land
- The priorities of the mining industry versus the pastoral or agricultural industries in the allocation of water resources

Policies and legislation were developed on an *ad hoc* basis in an attempt to balance the interests of the competing industries, but when the riparian rights and lands of settlers were at stake, the mining industry invariably won, regardless of the cost to the environment, other resources or local communities (Hearn 1981). Governments were committed to the promotion of mining because of the key role that the industry played in the colonial economy (Hearn 1981). T.J. Hearn has written exhaustively about the changes in legislation that occurred as a consequence of the controversy between the industries, and noted that at the heart of the conflict between miners and settlers was the application of two different rights structures to the same resources of land and water (Hearn 1981, 2002). Between 1860 and 1907, eight tenures were introduced: agricultural leases (1860), deferred payments licences (1872), perpetual leases (1882), small grazing runs (1885), leases-in-perpetuity (1892), occupation with right of purchase (1892), occupational leases (1894) and renewable leases (1907). All of these except deferred payments were types of leasehold. Hearn commented that:

> 'To meet miner demands, the right of entry to all leasehold lands was reserved, all leases could be terminated if the land were required for mining, and, in the case of four of the tenures, owners or occupiers were not to have any right of action for any damage resulting from the diversion or fouling of water courses.' (Hearn 2002: 93)

In the 19th century, mining and land laws:

> '... imposed few restrictions on the use of resources, while discounting social and environmental costs in the interests of sustained exploitation. Gold miners interpreted mining law as offering unlimited licence for their enterprise and sought appropriate measures whenever such licence appeared to be under threat. Parliament largely acceded to their demands.' (Hearn 2002: 98)

4.3.2 Maori loss and protest

Maori, increasingly dismayed by the lack of adequate reserves and the inexorable loss of their mahika kai, demanded use rights to land and mineral wealth in the high country and elsewhere (Evison 1993). For example, in January 1874, Horei Kerei Taiaroa wrote to the native minister, Donald McLean:

> 'You must also observe that precious stones have been obtained by the Pakeha from here such as gold, Greenstone & c and also that the people, their sheep, cattle and their animals subsist on the Island. My opinion is that it is not right that the minerals should be taken from the Ground because the land has not been paid for by any other people.' (Taiaroa 1874)

European officials mostly chose to ignore their complaints (Evison 1993).

In June 1878, Wereta Tainui and others of Arahura wrote to the Premier and Minister for Native Affairs pointing out that their kaika nohoanga were scattered all over the South Island high country, foothills and lowlands. They said:

> 'We are known to be the permanent occupiers of this side of this island of Waipounamu (Middle Island) of the portion called Te Poutini ...
>
> 'Our Eel pa's [*sic*] are now in disuse when we go to prepare that branch of our food we are driven away from there ... we still retain a right to our claims our Burial places and our cultivations ... one of the burial places still remains in the hands of the Natives but the others are outside the portions retained by the Maories [*sic*], and the cultivations are scattered all over the island it was impossible to have them all together they are scattered about at different places within the exterior boundaries of the land, that is why we say that the Government should carefully investigate this matter of these cultivations of ours, our parents and ancestors, if they had been cultivations for an influential people like the Pakeha a law would have been enacted to protect them ... they have made a law that any person found trespassing on their property will be prosecuted by the owner the maories say those are our cultivations and they take no notice.' (Tainui 1878)

Because of these and other Maori protests concerning the loss of land, mahika kai and kaika nohoanga (such as that by the prophet Te Maiharoa on the upper Waitaki River), in 1878 Hori Kerei Taiaroa, son of the Kai Tahu chief Te Matenga Taiaroa and Member of the House of Representatives for Southern Maori, came to an agreement with John Sheehan, Minister for Native Affairs, that a Commission of Inquiry would be held into past purchases of Kai Tahu land (Evison 1993). On 15 February 1879, a Royal Commission, comprising Judge Thomas Henry Smith of the Native Land Court and Francis Edward Nairn, a Nelson settler, was appointed to investigate whether or not any promises remained to be fulfilled and whether or not reserves had been made in terms of the original agreements. Their brief was limited to the land sales that were of interest to Taiaroa: Otakou, Kemp's Purchase, Murihiku and Akaroa (Evison 1993). Taiaroa organised marae sessions with kaumatua to copy down details of the myriad mahika kai and kaika nohoanga that Kai Tahu had traditionally made use of in the Otakou and Kemp's Blocks (Evison 1993). Note that it was for this inquiry that H.K. Taiaroa produced his record of mahika kai that was to become important in the Waitangi Tribunal claim, and which DOC now relies on for tenure review.

By late 1879, the Smith-Nairn Commission had examined 24 witnesses and almost finished hearing evidence on Kemp's Purchase (Evison 1993). Grey's ministry fell in October. John Hall became Premier, William Rolleston the Minister of Lands, and John Bryce Native Minister (Evison 1993). In April 1880, after the Commission had heard 65 further submissions, Bryce

refused the Commission any more expenses. It went into recess with the Murihiku hearings unfinished and never resumed (Evison 1993).

On 31 January 1881, the Smith-Nairn Commission issued its report (Smith & Nairn 1881). The Murihiku inquiry was not complete, but with regard to the Otago, Kemp's and Akaroa Purchases, the Commission had arrived at definite conclusions (Evison 1993: 456):

- Kai Tahu at the time of these three purchases had been entitled to the New Zealand Company's 'Tenths', on the grounds that the Otago and Kemp's Deeds had been made out to the Company
- Kai Tahu were therefore entitled to one-eleventh of the total proceeds that the Crown had received from the sale of land within the Otago and Kemp's Blocks, with accumulated interest, less the value of reserves and other government benefits that they had already received

Nothing happened. Attention was focused on the Parihaka crisis in Taranaki (Evison 1993). Alexander Mackay, Native Land Purchase Commissioner, supported the Kai Tahu case in his official report of 1881, emphasising the disadvantages they had been subjected to with the loss of their mahika kai and kai moana, like those suffered by Te Maiharoa and his people:

> '... on going fishing or bird-catching, they are frequently ordered off by the settlers if they happen to have no reserve in the locality. This state of affairs, combined with the injury done to their fisheries by the drainage of the country, inflicts a heavy loss on them annually and plunges them further into debt, or keeps them in a state of privation. All this is very harassing to a people who not long since owned the whole of the territory now occupied by another race, and it is not surprising that discontent prevails, or that progress or prosperity is impossible. The small quantity of land held per individual—viz., fourteen acres, and in some cases the maximum quantity is less—altogether precludes the possibility of the Natives raising themselves above the position of peasants. A European farmer finds even 100 acres too small to be payable ...' (Mackay 1881: 16)

4.3.3 Government centralisation

The role of the provincial councils had become more important to the colony than that of the central General Assembly (Condliffe 1959). Some southern councils, like that of Otago during the 1860s gold rush, had had more money than Central Government, which at the time was funding the New Zealand Wars. Land legislation in the various provinces had been inconsistent and confusing, and the cost of running 11 legislatures in a colony with less than 300 000 people was exorbitant (Condliffe 1959). Five South Island provinces—Marlborough, Nelson (which included Amuri from 1853 to 1876), Canterbury, Otago and Southland—had extensive areas of high country (McKinnon 1997). The rapid development of a transport grid during Vogel-led governments in the 1870s helped to facilitate travel from these remote districts to the capital city. Centralisation of government at Wellington was inevitable. The provincial councils were abolished in 1876. Their control

of land legislation and administration could not have lasted indefinitely (Condliffe 1959).

4.3.4 Freehold and leasehold

Vogel was voted out of office in 1877 and the Liberal leader Premier George Grey brought in the Land Act 1877 to consolidate and systematise the diverse array of provincial legislation (Condliffe 1959). Crown pastoral leaseholders in the high country were affected by these laws (Condliffe 1959; McLintock 1966):

- The Government repealed 56 statutes and set up a centralised policy.
- Auction sales for pastoral leases were introduced and a system of deferred payments in the sale of waste lands was adopted.
- Crown land could be sold for cash or on deferred payments with conditions requiring improvements and personal residence.
- Special conditions were applied to pastoral runs in Canterbury and Otago, with leases being offered at auction and occupiers being given the right to freehold land around their homesteads.
- The first land tax in the colony was initiated. Although low, at a flat rate of a halfpenny in the pound on all land in excess of £500 in value, it was repealed in 1879 when Grey lost office.
- The provinces, provincial councils, commissioners and waste-lands boards were replaced by land districts, land boards and commissioners of Crown lands responsible to the minister.

Three key methods were frequently employed in the high country and on the downlands to exclude competitors during the land boom of the 1870s. According to Hargreaves (1966), these were:

- 'Spotting', where runholders purchased key small sections, particularly those near waterways, often by pre-emptive rights, leaving other sections unusable.
- 'Dummying', when ownership of blocks of land was vested in other family members or employees while really staying in the possession of the runholder.
- 'Gridironing', which occurred when runholders bought several of the smallest possible (20-acre; 8.1-ha) sections fronting a road, leaving 19-acre (c. 7.7 ha) sections in between. These could be sold only at auction and were too small to be of much value to anyone else.

Despite these runholder techniques, as railways expanded and markets became more accessible and land more valuable for resale, the percentage of 'cockatoos' or small farmers grew (Hargreaves 1966).

In Canterbury Province by the end of 1878, all of the plains were freehold (except for poor pieces of land). Crown pastoral leasehold was now mostly confined to high country over 300 m and was divided among 182 properties averaging c. 22 000 acres (8910 ha). The biggest properties were owned by large companies. These were mostly paper holdings representing mortgages. The New Zealand Loan and Mercantile Agency

held 646 537 acres (c. 261 847 ha) and the Trust and Agency Company of Australia held 427 427 acres (c. 173 108 ha). A few individuals or groups owned areas of land in excess of 50 000 or 100 000 acres (20 250 or 40 500 ha).

Although Otago had larger pastoral runs and flocks, Canterbury was regarded as the land of squatters and extensive runs (Scotter 1965). This was probably because the pastoral interest in Canterbury had remained powerful, while in Otago from the time of early European settlement other industrial interests had challenged those of the runholders, such as gold mining and the small-scale farming introduced by the hundreds system.

During the late 1860s and the 1870s, the political power of the pastoralists had been challenged by groups who aimed to bring about radical land law reform: ex-goldminers, immigrants from Britain who arrived as part of Premier Julius Vogel's expansionist programme, and urban businessmen and promoters who wanted closer settlement around their towns (Hearn 1971). However, the power of high-country runholders was not challenged until technological advancement undermined the commercial importance of the wool markets (Hearn 1971). The freezing works that sprang up along the east coast of Canterbury, Otago and Southland in the 1880s and early 1890s were to boost the number of small farmers and their economic and political clout.

4.3.5 Scab control

After Government had been centralised, the campaign against pastoral pests intensified. The abolition of provincial governments and passing of the Sheep Act 1878 together dismantled local resistance to the control of scab in the high country and elsewhere (Sherrard 1966). According to McKinnon (1997):

- Sheep districts and subdivisions were established, and staff were appointed to inspect flocks
- Penalties were imposed for the possession of infected sheep, and the movement of sheep by sea and land was monitored
- Quarantine stations and designated crossing places were set up, and methods were prescribed for disposing of infected animals

Scab disappeared during this period. Canterbury, Napier and Otago Districts were declared free of the disease in 1879 (Scotter 1965). They were still the only clean districts in 1884. Although Amuri was declared clean in 1885, 10 000 sheep were destroyed in the following year on a run near Kaikoura (Scotter 1965). Another 800 sheep were killed in Kaikoura in 1889. New Zealand as a whole was not declared clean until 1892 (Scotter 1965).

4.3.6 Rabbit destruction

Efforts to eradicate rabbits from the high country (and New Zealand in general) were not so successful. The Rabbit Nuisance Act 1876 emphasised that rabbit destruction was the responsibility of the farmer,

but it also supported the establishment of Rabbit Boards. These boards were set up to police the killing of rabbits and, when farmers failed to cooperate, they took action (Nightingale 1992). In practice, the Act was difficult to enforce because rabbits flowed over boundaries and proved impossible to eliminate (Nightingale 1992).

The Rabbit Nuisance Acts of 1880–82 replaced Rabbit Boards with Stock Branch Sheep Inspectors who had powers to destroy rabbits on Crown land and to enter private land and serve notice if they found rabbits. If a run was deemed to be infested, the landholder was made to pay for eradication and had no right of appeal.

Although runholders resented the intrusion of inspectors into their kingdoms and demanded a reduction of their powers (Sherrard 1966), the Act did bring certain results. Both runholders and small farmers responded by trapping, laying poison and liberating ferrets (Sherrard 1966). For example, on Greenhills Station by 1884, rabbit numbers had declined to the extent that pigs and even sheep were being used instead of rabbits to feed the ferrets (Sherrard 1966). However, efficient eradication methods at Greenhills drove the silver grey rabbits over the Seaward Kaikoura Range to Warden, Tytler and Kekerengu Runs. They then went up the Elliott River and over the Inland Kaikoura Range to mate with the brown rabbits in the Awatere Valley (Sherrard 1966). High-country runholders and farmers argued that they should not have to bear the expense of destroying rabbits that had come onto their properties from adjacent farms and Crown reserves (Sherrard 1966). After A.C.V. Bligh abandoned the Waiau-toa Block, government inspectors went in to poison rabbits with phosphorous (Sherrard 1966).

The Rabbit Nuisance Act 1886 brought a change in official attitude, thus appeasing the runholders. The Government now accepted greater responsibility for rabbit destruction (Nightingale 1992):

- Boards were reinstated and their control restored
- The powers of inspectors were redefined
- The Government began to subsidise rabbit boards pound for pound

The 1886 select committee that was appointed to inquire into the rabbit plague concluded that when Crown pastoral leases (now mainly confined to the high country) were due to expire, tenants on pastoral properties spent less money on pest destruction. They therefore advocated longer leases and rewards for improvements (Holland et al. 2002).

4.3.7 Acclimatisation of exotic species

During this period, the Government supported acclimatisation and even protected introductions of exotic wildlife. Although it gained power to protect native birds in 1886 (Grey 1994), written consent to import plants and animals was not required until 1895, and a list of protected species would not be completed until 1907. Not until 1921–22 would the Animals Protection and Game Act offer full protection for most native birds and some land mammals (Grey 1994).

4.3.8 Economic depression

The 1880s were a time of severe economic depression when high-country runholders also had to deal with the depredations of rabbits. Some left their runs and many more prospective tenants clamoured to go onto the land (Condliffe 1959). In a bid to assist existing or new runholders, Rolleston (then Minister of Lands) formulated the Land Act 1882. This introduced the perpetual lease, which provided land at low rental for tenants who had their leases revalued every 30 years, and gave tenants the right of purchase at low values (Condliffe 1959).

In 1885, Robert Stout became Premier and John Ballance the Minister of Native Affairs and also of Lands. Ballance's Land Act 1885 initiated the small grazing run lease, whereby land of 5000 acres (2025 ha) or less could be taken up for terms of 21 years with the right of renewal. This tenure proved popular and long lasting (Condliffe 1959).

4.3.9 Royal Commissions concerning Kai Tahu

By 1886, Stout's Government had decided that while Smith's and Nairn's recommendation of financial compensation for Kai Tahu on the basis of the 'tenths' was not acceptable, the claim could be settled by granting more land (Evison 1993). In May 1886, Ballance appointed Alexander Mackay (who in 1884 had become a judge of the Native Land Court) as a Royal Commissioner to investigate landlessness among Kai Tahu and to find out how much land would be required to meet their needs (Evison 1993). Mackay sent in his report, which was strongly sympathetic to Kai Tahu, in May 1887. In addition to the points he had raised in 1881, he wrote that:

> 'Another kind of food they have been deprived of is the root of the ti called "kauru." This was a very nutritious food, and was obtained by baking the roots in a Native oven, in which state it contains a large quantity of saccharine matter. Its preparation in places where the tree abounded gave employment to a large number of persons during the months of December, January, and February, it being used as an article of barter, in exchange for other kinds of food, and also for clothing.' (Mackay 1888: 8)

The Dart River Bridge site in the upper Wakatipu District is an example of a high-country place where kauru had previously been prepared, but which had been transformed into grazing land since the arrival of European settlers.

As compensation for the loss of their mahika kai, Mackay recommended that Kai Tahu be awarded more land. He also acknowledged that Kai Tahu attachment to their ancestral land had a spiritual quality:

> 'The general sentiment of the Maoris in olden times with respect to their territorial possessions is not generally understood: it was not "earth-hunger", but "earth-love." They felt keenly the parting with their rights over the land of their ancestors, when the soil, with all its memories and the dignity conferred by its possession, had passed over to the stranger, and in its place they had acquired only perishable goods, or money, which was speedily dissipated.' (Mackay 1888: 8)

Stout's Government was replaced by that of Atkinson in October 1887. On 10 December 1890, Mackay was again appointed as a Royal Commissioner, this time to find out which individual Kai Tahu actually had insufficient land on which to support themselves (Evison 1993).

Mackay submitted his report in May 1891 (Evison 1993). He found that of about 1500 Kai Tahu in Canterbury, Otago and Murihiku, only Taiaroa and one other, Topi Patuku, had more than 500 acres (202.5 ha) of land, while nearly half the people had none at all. The Kai Tahu reserves were mostly land of inferior quality and those that had been of better quality had become less fertile because of overuse. For example, when asked by William Rolleston, Under-secretary in the Native Department, at the Native Land Court in Dunedin if he tilled his land when it was 'worn out', Horomona Pohio, who had accompanied the prophet Te Maiharoa during his occupation of Te Ao Marama and had been his spokesman, replied, 'When it is worn out we should desert it but are obliged to go on cultivating. If we had other land we should leave worn out land and let it recover and then return' (Pohio 1868). Growing numbers of Maori were leasing their land to Europeans (Evison 1993). Many were poor and depressed, and saw no hope for the future (Evison 1993).

4.3.10 Runholders and the Long Depression

Some high-country runholders left their land during the Long Depression (1879 to the mid-1890s), a number of whom were forced to give up their holdings to loan and other financial companies (Scotter 1965). By the end of the 1880s, the previously 509 runs held in 182 properties in Canterbury had been reduced to 336 runs worked as 66 holdings (Scotter 1965). Twenty-two Canterbury properties passed into the hands of finance companies between 1879 and 1890 (Acland 1975). They were all large pastoral stations, 15 of which were high-country runs and were probably leased from the Crown. Numerous runholders had been ruined by the depression, scab, rabbits and snow (Scotter 1965). However, the largest high-country leaseholdings were secure. For instance, William Gerard still held 21 runs amounting to 134 868 acres (c. 54 622 ha) on Double Hill, Manuka Point and Snowdon, and ran 54 000 sheep (Scotter 1965).

When the Canterbury leases were due to be renewed in 1889, the runs were rearranged into three classes before being re-offered (Scotter 1965):

- The western, high-country areas, including the mountain tops, glaciers and shingle slopes—2.3 million acres (931 500 ha), were divided into 68 holdings of mostly well over 5000 acres (2025 ha) each
- Better land, which could possibly be economically worked in blocks of 5000 acres or fewer, and which was used to establish 50 runs of a total of 154 000 acres (62 370 ha)
- 51 000 acres (20 655 ha) on or adjacent to the Plains, which were divided into 19 agricultural/pastoral runs

For a decade, land officers had been urging fixity of tenure to encourage better care of runs, and on 31 May 1889 the Canterbury runs south of the Rangitata River were offered at auction on fixed terms of 10–21 years (Scotter 1965). J.B.A. Acland and C.G. Tripp renewed theirs. George Rutherford outbid Thomas Teschemaker for his Otaio run, allegedly from spite over a horse-racing scandal (Scotter 1965). There were no bids for those infested by rabbits in the Mount Cook region. Northern Canterbury runs were offered on 4 June with the same fixed tenure, and William Gerard and G.A. McMillan renewed their leases (Scotter 1965). The Loan and Mercantile Company now held 330 000 acres (133 650 ha), half of the area it held before, and there were few banks or companies among the other lessees (Scotter 1965).

In Amuri County, there were relatively few changes of ownership up to the end of the 19th century, which contrasts with the earlier period. By the early 1880s, the district was known as 'one of the last great squatters' preserves in New Zealand. Securely freeholded, the stations were legally impregnable until their owners chose to sell, or until Parliament enacted a new kind of land legislation' (Gardner 1956: 290). Although half the great estates were for sale, the mortgagees refused to sell at a loss and rarely sold at a profit (Gardner 1956). Since New Zealand was in the throes of depression, anticipated subdivisions did not occur when the railway reached Culverden in 1885 (Gardner 1956). In both Canterbury and Marlborough, the banks and the station agencies had increasing numbers of properties to sell. Even though in Amuri County nearly all runs carried mortgages, runholders mostly weathered the storm because, according to Gardner (1956), they possessed fine properties and managed them well.

During these harsh economic times, pastoralists with vast runholdings, including those in the high country, were often attacked publicly (Gardner 1956). Many people believed that land aggregators were preventing hard-working and thrifty farmers from taking up small blocks of land (Gardner 1956). In response to such hostility, Andrew Rutherford wrote wryly to the *Marlborough Express* that squatters, like the moa, were about to become extinct, and that he was anxious to preserve a few in Amuri so that future generations would have something to abuse (Gardner 1956). Despite Rutherford's pessimism, after the depression ended in c. 1895, the Amuri runs were to enjoy an Indian summer of fame and prosperity, and the runholders became known throughout New Zealand as the 'Amuri Wool Kings' (Gardner 1956).

By 1892, most of the best land in New Zealand had been freeholded. Vast high-country areas were still owned by the Crown but, in general, these were of poor quality, rabbit infested or isolated with difficult access (Condliffe 1959).

4.4 SUMMARY

4.4.1 General historical features

- Increasing pressure on land available for development
- Intensification of farming methods
- Population explosion and rapid development of the transport grid
- Declining land fertility and stock numbers
- Centralisation of government land administration (1876) leading to uniformity of Crown pastoral leases
- Elimination of scab assisted by central government control of provincial law and its administration
- Ascendancy of rabbits
- Construction of homesteads and station buildings using materials manufactured nearby or brought in from outside, and erection of grander houses
- The advent of refrigeration in the 1880s encouraged cross-breeding of sheep for meat and for wool, sowing of permanent exotic pasture, fencing of paddocks, and growing of supplementary winter crops on low-lying land
- Crown pastoral leasehold land mainly confined to the high country
- Development of tourist routes, hotels and coach services
- Mining and sawmilling

4.4.2 Key physical resources

- Light (No. 8 gauge) wire fences
- Rabbit-proof fences, rabbiters' huts and rabbit-poison containers
- Snow fences
- Flood gates and road gates
- Homesteads, many of which were built of imported materials
- Other station buildings, such as shearers' quarters and woolsheds
- Clusters of buildings and trees encompassing the homesteads
- Droving tracks
- Tourist routes
- Accommodation houses and hotels
- Mail and passenger coaches
- Roads, railways, bridges and telegraph lines
- Quarantine stations
- Sheep dips
- Use of concrete for station construction
- Abandoned mines and sawmills

5. 1891–1912: The Liberal era

5.1 LANDSCAPE MODIFICATION

By 1890, throughout the mountainous and lower sub-alpine areas, tall tussock grasslands had been transformed by fire and grazing pressure to short grasslands. Areas that were once the domain of indigenous species had been invaded by naturalised grasses from Australia, California and Europe. Throughout the high country, but especially in drier parts, native grassland ecosystems had been steadily altered by exotic grasses tolerant of low soil fertility, by sheep and cattle grazing, and by rabbit browsing. There were few palatable herbs in tussock grassland; consequently, these areas could easily be overgrazed (Holland et al. 2002). The result was a steady depletion of the range lands. By this time, rabbits had become a plague in many parts of the high country (Holland et al. 2002).

In 1910, F.W. Flanagan, H.D.M. Haszard and James Stevenson, Crown Lands Commissioners, when reporting on the Canterbury pastoral runs wrote:

> 'In travelling over the Mackenzie Plains one is impressed with a weary feeling of sadness and regret at the large extent of country which is almost depleted of all vegetation, save sorrel and "scab-weed." The affected area contains about 90,000 acres. The dead and dying condition of the native grasses over such a large area is a matter of grave importance to the Dominion. There is amongst the settlers in the Mackenzie country a difference of opinion as to the cause of the depletion. The oldest settlers allege that it is due primarily to the burning of the native tussock some forty years ago, and that, owing to the ravages of rabbits, frosts, droughts, and high winds characteristic of the climate, it has not been able to become re-established.'
>
> (Flanagan et al. 1910: 7)

The commissioners concluded that probably nothing had contributed more to the widespread destruction of pastoral high country than the indiscriminate burning of native tussock (Flanagan et al. 1910). The result had been a dramatic reduction in the carrying capacity of the properties. While they thought that 'a proper amount of burning at the proper season' was necessary and beneficial, the real damage was done by the summer burning (Flanagan et al. 1910: 8). This type of burning, which they said should be stopped, was usually done by musterers, who signalled to one another from ranges by fires, which were allowed to spread rapidly unchecked (Flanagan et al. 1910). When fire swept over the sunny faces, the tussock almost burnt out, and in a very dry summer fire would wipe it out altogether. Then the mountains would begin to disintegrate—rocks would loosen, tearing away the mountain sides and triggering shingle slides. The commissioners wrote that 'As a rule, pastoral lessees give their irresponsible musterers a free hand as to burning' (Flanagan et al. 1910: 9). They recommended that new licenses contain a condition prohibiting the burning of native grasses,

except in spring, to create firebreaks, and that inspection of pastoral runs be carried out systematically. Rabbit inspectors could perform this task as part of their inspection work in the high country (Flanagan et al. 1910). The commissioners also recommended that, wherever possible, English grasses be sown on the surface, and that the Government plant the Mackenzie Country with trees to ameliorate extremes of temperature, help make the country safer for stock and create shelter. They advised that reserves for travelling stock be established (Flanagan et al. 1910).

At the same time, botanist Alfred Cockayne published the first serious scientific study of farming practices on tussock grasslands for the Department of Agriculture (Cockayne 1910). He firmly rejected any arguments in favour of burning, contending that it increased pasture growth and carrying capacity only briefly, and that the ultimate consequence was deterioration and depletion:

> 'I am fully aware that even now many runholders will scout the idea that burning will, if persisted in, cause an almost entire depletion of most of the natural grazing areas in the drier portions of the South Island. One has only to point to the deplorable conditions of many of our southern runs, however, to appreciate the significance of this pernicious practice.' (Cockayne 1910: 15)

By the late 19th century, landholders and government agencies began to appreciate that open-country environments require diligent management to ensure their continuing productivity (Holland et al. 2002). The vegetation depletion and degradation brought about by fire and grazing animals had caused stocking rates to plummet. There were 511 188 sheep in Vincent County, Central Otago, in 1880, but just 315 757 40 years later (Holland et al. 2002). On the rabbit-infested lands of Galloway Station in Central Otago, sheep numbers fell from 75 000 in 1879 to 21 000 in 1904 (Holland et al. 2002), when land degradation was at its worst. In open country where unimproved grassland prevailed, carrying capacity began to decline in the 1880s, the area covered by scabweed expanded alarmingly, shingle fans grew and steeper slopes failed (Holland et al. 2002). After the boom year of 1878, falling wool prices, several cold winters (which culminated in the heavy snows of 1895) and runholders' attempts to maintain sheep numbers despite increased numbers of rabbits resulted in reduced wool clips from malnourished Otago sheep (Holland et al. 2002). By comparison, in New Zealand as a whole, refrigeration (which meant that sheep could be bred for meat as well as wool) had stimulated an increase in sheep numbers from 12 985 000 in 1881 to 20 233 000 in 1901 (Thornton 1986).

In one account, written in the early 1890s, the owner of Molesworth Station, William Acton-Adams, described the soil erosion on the Elliott run:

> 'If you notice the slopes of the hills, particularly at the upper end, the surface is peeling away through the rabbits and dry weather and large patches of land are becoming useless. This is exactly what ruined the Awatere Runs and it threatens to ruin a great part of this block.'
>
> (Acton-Adams 1891, cited in McCaskill 1970: 76)

By the early 20th century, most high-country mahika kai had been destroyed, especially in Kemp's Block (Evison 1993). High-country bush continued to be razed by burning and sawmilling. For example, it is thought that the bush at Freehold Creek continued to be cut until around 1903 (Ian Hill, DOC, pers. comm.). Stoats and cats were killing native birds (Evison 1993). Deer were penetrating the forested river valleys. In 1892, Reverend P. Walsh, an amateur botanist, published a warning concerning the introduction of deer to the country. Whereas in Europe deciduous trees had evolved in the presence of ruminants of many types, in New Zealand the situation was quite the reverse. He wrote that the forest had evolved in the absence of any four-footed browsing animals, and the constituent parts were so interdependent for nourishment and protection that once the balance was disturbed, the entire growth would rapidly deteriorate (McCaskill 1973). His warning went unheeded and deer were protected for many years.

5.2 PHYSICAL REMAINS

5.2.1 Effects of refrigeration

Historian Jim McAloon contended that:

> 'Of all the changes in the farming sector between 1880 and 1914, the most important were those related to refrigeration. Whereas once the entire primary exporting sector had been dominated by wool, by 1900 this was no longer so. Meat, butter, and cheese had provided alternative and more reliable sources of income. The rise of the frozen meat industry added to the incentives for improving flocks, as it created the need for different breeding arrangements in order to achieve a type of sheep that would produce optimum meat and wool.' (McAloon 2002: 49)

The invention of refrigerated shipping altered the relationship between runholder and small farmer. Meat had become at least as valuable as the fleece. Refrigeration made possible the production of meat and also dairy products for overseas markets on small, intensively farmed blocks of land. By the late 1880s, freezing works had been built by the main ports (Hornby, Islington, Ashburton, Smithfield, Pukeuri, Burnside, Mataura, Makarewa and Ocean Beach) and a few ships had been fitted out. Prosperity returned after 1895, continuing until 1921, and small farmers flourished, becoming a force politically. American anthropologist Elvin Hatch wrote that:

> 'Refrigerated shipping, then, did not eliminate the distinction between farmers and run-holders, for now two rather different kinds of sheep raising coexisted. One, sheep farming, was a variety of intensive agriculture, for it involved the use of agricultural equipment to work the soil. The people who engaged in this production were cockies; their farms were labor intensive, they required only a few hundred acres to support their families, and their incomes came from the sale of both meat and wool. The other form, run-holding, was a continuation

> of extensive [high-country] pastoralism, inasmuch as the flock consisted of merinos that were fed on tussock. Agricultural equipment played a minor role in the run's operation, which was not labor intensive. A minimum of several thousand acres were needed to support a family. And a large majority of the run-holder's income came from the sale of wool.' (Hatch 1992: 28)

5.2.2 Great estates

Runholders of large areas in the high country and on the foothills and plains (sometimes known as 'gentry') were set apart from the workers and the small farmers by their spacious homes and gardens and the number of household and station staff they employed (Hatch 1992). Figure 18 shows staff at Castle Hill Station, and Fig. 19 gives a more distant perspective of the station buildings, with a water reservoir in the foreground. Runholders came from varied backgrounds and had a wide range of incomes. Some originated from Britain's upper middle class, others had been poor but astute and experienced Scots shepherds. Some had small, poorly situated and marginal holdings, while others leased or owned several estates (Hatch 1992). Wealthy runholders led a genteel social life, organising parties for activities such as tennis, hunting and shooting (Hatch 1992). Two examples of prominent pastoral runs are Cheviot (part of which was Canterbury high country) and Otekaike (Otago high country).

Cheviot

William Robinson had purchased land between the Hurunui and Waiau Rivers on the Cheviot Hills Run of J.S. Caverhill in 1856, the western part of which included the high-country Lowry Peaks district (Gardner 1990). Between 1857 and 1862 he freeholded the 84 000-acre (34 020-ha) Cheviot Hills Run. His great wealth did not make him popular during the Long Depression, and his extravagant purchases of land, stock and buildings earned him the nickname 'Ready Money Robinson' (Gardner 1990). However, he was also an extremely competent pastoralist. In 1879, he built the Port Robinson slipway and the Hurunui Bridge, and his large mansion was completed in 1888 (Gardner 1990). Historian W.J. Gardner wrote that 'Cheviot Hills became a self-sufficient kingdom and a symbol of runholder wealth. A lover of trees and birds, Robinson surrounded his house with gardens and plantations and set out miles of hawthorn hedges, parts of which still survive' (Gardner 1990: 371). The year of his peak sheep return was 1886, when 105 000 were counted.

Otekaike

A station in northern Otago, initially known as 'Run 28' and with boundaries at Kurow and Otekaike Creeks, was later known as 'Otekaike' (Hall 1985). It was first licensed in 1854 to Samuel Hillier Pyke, but soon changed hands twice. The third owner, John Parkin Taylor, lived in a cave. In 1861, William Heywood Dansey purchased the property and quarried limestone near this cave to construct a dwelling (Hall 1985). In

Figure 18. 'Culinary operations' in the uncompleted limestone buildings of Castle Hill Station. *Photo courtesy of Canterbury Museum (Denham Collection; reference number CMNZ 15551).*

Figure 19. Castle Hill Station, with water reservoir in foreground and the old homestead in the distance. Kura Tawhiti is the low hill in the middle distance at the right. *Photo courtesy of the Alexander Turnbull Library, Wellington, New Zealand (reference number 104398 ½).*

1864, Otekaike was transferred to Robert Campbell. By this time, 12 300 sheep grazed on the property (Hall 1985).

Eton-educated Campbell, in partnership with William Anderson Low, had acquired Benmore Station in the upper Waitaki in April 1863 (Hall 1985). Campbell and Low paid £36,000 for the 200 000-acre (81 000-ha) property and around 15 000 sheep. Campbell and his family firm in England, Robert Campbell and Company, also had interests with Low in Galloway Station, similarly situated in the upper Waitaki. Otekaike became the family firm's headquarters for their New Zealand estates. By 1868, Robert Campbell was running 24 000 sheep there (Hall 1985).

Since he had access to capital, Campbell was able to survive periods of recession and depression (Hall 1985). However, his money was used more for the extensive acquisition of land than for improvements. In 1869, he took up Run 17 (Ben Lomond), which extended Otekaike's boundaries beyond Otekaike Creek to the Maerewhenua River, Station Peak on the other side of the Waitaki River in South Canterbury, and Rocky Point, which adjoined Station Peak in the upper part of the Hakataramea Valley (Hall 1985).

By 1876, Campbell had a vast network of landholdings all over Otago and Southland (Hall 1985). In North Otago he held almost 300 000 acres (121 500 ha) of land. By 1877, he owned the largest number of sheep (155 000) in the entire district (Hall 1985). His various Waitaki properties were managed as one.

Otekaike was also prominent because of its stud merino flock and baronial-style homestead (built in 1875–76) and grounds (Hall 1985). The English-style manor was stately and dignified, with a conservatory, wide lawns, avenues, gravel drives, ponds and water lilies, peacocks, extensive stables, and a lodge (Hall 1985).

The lease for Run 28 expired in 1878. The Government resumed control of 9000 acres (3645 ha) of it and Campbell retained the rest (Hall 1985). Lying west of the station homestead between Kurow and Otiake Creeks, the land was settled as small farms. Run 17 was also taken back by the Government and offered for sale in 1880 (Hall 1985).

In 1889, a new company named 'Robert Campbell and Sons Limited' was formed to run the New Zealand properties. At the time, Otekaike Station consisted of c. 19 000 acres (7695 ha) of freehold land and 37 000 acres (14 985 ha) of Crown leasehold land. Although Robert Campbell died in 1889 (aged only 46), the collective Campbell properties in New Zealand survived intact because they were in the hands of extremely competent managers (Hall 1985). A nephew, Robin O. Campbell, took over the supervision of the company's Waitaki properties in 1897, and he and his wife perpetuated the Otekaike tradition of ostentatious display and *noblesse oblige* (Hall 1985).

5.2.3 Small farms

The total area of Crown pastoral leasehold land in South Canterbury had decreased from 2 276 213 acres (c. 921 866 ha) in 1871 to 1 473 269 acres (c. 596 674 ha) by 1881, and then remained relatively constant until 1891, when it was 1 580 706 acres (c. 640 186 ha) (Hearn 1971). Virtually all Crown pastoral leasehold land was in the high country. By 1880, the readily accessible and more valuable Crown lands had generally been taken up. A trend toward smaller holdings on the downlands had been evident from 1878 and even earlier (Hearn 1971).

The agricultural recovery after 1895 created a demand for farms, inflating the value of land and prompting owners of large properties to sell (Hatch 1992). The new sheep farming was better suited to small family farms than to large-scale operations, and family labour was cheaper than hired labour. Some pastoralists on the plains and foothills became farmers after subdividing their properties and keeping a portion for themselves (Hatch 1992). Others who had land in high-country areas that were not suited to farming carried on as runholders, but at times subdivisions occurred for family and financial reasons, and the land was carved up into medium-sized runs (Hatch 1992).

Between 1886 and 1906, sheep numbers in the North Island rose by 3.9 million while those in the South Island fell by 1.3 million (Duncan 1962). Mixed crop and livestock farming expanded in areas such as the downlands of North and South Canterbury, and in Central Otago, where extensive grazing still prevailed in 1886. Geographer J.S. Duncan contended that:

> 'The overall decline in sheep numbers was due partly to slaughtering for the frozen meat trade (about five million carcases a year were being exported by 1906), partly to a fall in the carrying capacity of the tussock grasslands as the result of overgrazing, excessive burning, and the rabbit plague, and partly to snow losses on the high country.'
>
> (Duncan 1962: 175)

In 1906, small farms occupied roughly twice as much of the better quality New Zealand land as they did in 1886, and there were nearly twice as many of them. Duncan concluded that:

> 'As a result, a fundamental fact of the modern pattern of settlement in New Zealand began to appear: the marked contrasts in size of farm and density of rural population between the steep hill country and the flat or rolling lowlands.' (Duncan 1962: 190)

5.2.4 Transport and communication

More accommodation houses were built to cater for drovers, carriers and other travellers to and from the high country. For example, in 1901 a six-room building, furnished and managed by holders of the Waiau–Kaikoura mail and passenger service contract, was built in Kaikoura County, in the Conway Reserve, on the northern terrace above the ford on the inland road (Sherrard 1966). After the subdivision of Crown land near Greenhills Station, strangers could no longer expect to find shelter at the local sheep run (Sherrard 1966). Figure 20 shows the Bealey Hotel on the route to Arthur's Pass in Canterbury.

Conflict occurred between local and central government over who should build and maintain roads (Sherrard 1966). For example, the road south from Kaikoura to Christchurch, which was built between 1882 and 1887, was prone to slips in the winter, and when high-country runholders in Amuri County baulked at repairing the road, John McKenzie (Minister for Public Works) said in the House of Representatives that the members of the Amuri County Council belonged to:

> '... the one class—squatters and large land owners: in other words, they were "social pests" ... At certain seasons of the year they put the roads into a decent state of repair, in order to enable themselves to get their wool to the nearest shipping port or railway station; and for the rest of the year they did not require the roads ...'
>
> (McKenzie 1894: 273, cited in Sherrard 1966: 246)

In July 1896, the Amuri and Kaikoura County Councils received a negative response from McKenzie when they asked for aid, after 60 000 sheep and large mobs of cattle had passed through to Canterbury over the previous 8 months (Sherrard 1966).

Cheap rail transport was extremely important in facilitating market expansion (Sherrard 1966). The meat-freezing industry, for example, needed railways to carry sheep and lambs to the works, and frozen

Figure 20. Bealey Hotel, 1892. The number of coaches and their loads illustrates the volume of traffic over the key route of Arthur's Pass. *Photo courtesy of the Alexander Turnbull Library, Wellington, New Zealand (reference number 19638 ¼).*

carcasses to the ports. Every freezing works was situated next to the railway (Sherrard 1966). In the South Island, the main extensions to the railway system were the Central Otago line, which arrived at Clyde in 1907 (stimulating fruit growing in that district), and the branch lines to Culverden and Ethelton, serving the Amuri and Cheviot Basins (Sherrard 1966).

Developments in transport were a boon to Cheviot farmers. A continuous railway track from Parnassus to Christchurch and the Waiau River road-and-rail bridge were opened in 1911 (Haythornthwaite 1982). Before this, all traffic was forced to ford the dangerous Waiau River. For example, in December 1905 the *Cheviot News* reported that while crossing the river earlier that month:

> 'Mr Barr, of Barr & Davies was nearly drowned, a few days later a commercial traveller was capsized, losing all his stock and last week Misses E. and C. Holton were washed downstream and had a miraculous escape. On the same day the Parnassus gardener was washed off his horse. Early in January one of Mr A.W. Rutherford's wool wagons was returning with a load of timber [to the Amuri high country]. The horses had to swim and the wagon struck the stump of a tree and capsized. The horses were drowned and the driver was carried downstream for about a mile.'
>
> (*Cheviot News,* 6 January 1903, p. 2, cited in Holm 1992: 120)

The railroad enabled people, stock and wool to move from Cheviot to Christchurch much more easily. The trip took a day (Haythornthwaite 1982). The arrival of the first motorcar at Cheviot in around 1910 (Haythornthwaite 1982) heralded changes to the roadway system. At the time, the roads were all shingle and there were many streams to ford (Haythornthwaite 1982).

In the Mackenzie Basin in 1891, a telephone link was established from Fairlie to Burkes Pass (Whelan 1989). By 1896, it had been extended to Tekapo (Whelan 1989).

5.2.5 Population drift

Between 1886 and 1906, there was a strong population drift to the north (Duncan 1962). Since the gold rushes of the 1860s, the South Island had attracted more people than the North Island; the population difference between the two islands was numerically greatest in 1881 (Duncan 1962). That difference disappeared before 1901 (Duncan 1962). Local losses in the South Island were interspersed with local gains. The population of the alluvial goldfields of Otago decreased, while sawmilling brought increases in Clutha, Southland and Wallace Counties (Duncan 1962). By the 1880s, the sons of the first European runholders were looking for farms; because scope for subdivision was limited, they went elsewhere, frequently to the North Island, and many sons and daughters moved into urban areas (Duncan 1962).

There was also a shift in the comparative numbers of sheep. By 1898, the North Island had 150 000 more sheep than the South Island, and by 1900,

it had half a million more (Scotter 1965). In 1899, Wellington Province (with 4.05 million sheep) had 14 000 more sheep than Canterbury Province, where numbers had steadily declined since the great 1895 snow storm, which resulted in heavy continuous killing (Scotter 1965). In 1914, Wellington Province had 5.4 million sheep to Canterbury's 4.6 million sheep. The New Zealand total in the same year was 24.8 million (Scotter 1965).

5.2.6 Flocks

In 1896, the New Zealand and Australian Land Company had the biggest flocks in New Zealand: it had 84 000 sheep at the Levels in Geraldine County and 76 000 at Pareora and Hakataramea in Waimate County (Scotter 1965). Other large flocks in the south were those of Allan McLean (67 000 at Waikakahi), Arthur Elworthy (54 000 at Holme Station), and Acland and Tripp (both over 40 000) (Scotter 1965). In the Mackenzie Country, no owners had more than 30 000 sheep (Scotter 1965). In mid-Canterbury, William Gerard had 34 000 sheep at Double Hill and 21 000 on Snowdon, and J. Grigg and D. Cameron had 30 000 each (Scotter 1965). The New Zealand Loan and Mercantile Agency had 130 000 sheep in four flocks in Ashburton County and on three runs in Selwyn County (Scotter 1965). In Amuri County, A. Macfarlane and H. Wharton and Company had over 40 000 sheep (Scotter 1965).

In 1914, for the first time, not a single flock of over 40 000 sheep was recorded in Canterbury in the sheep returns (Scotter 1965). The New Zealand and Australian Land Company had 39 000 at Hakataramea (Scotter 1965). G. and D. Hamilton at Clayton, between Mount Peel and the Two Thumb Range, had 29 000 sheep (Scotter 1965). George Gerard ran 10 000 sheep on Double Hill No. 4 Run, 17 000 on Mesopotamia and 10 000 on his Snowdon freehold (Scotter 1965). In North Canterbury, the biggest flocks were owned by Pratt Brothers at St James Station and the New Zealand Loan and Mercantile Company at Acheron, Clarence and St Helens Stations (Scotter 1965). Twenty-two members of the Rutherford family in the northern counties owned a total of 140 000 sheep (Scotter 1965).

5.2.7 Scientific farming

John McKenzie, Minister of Lands, realised that if New Zealand's farmers were to compete in international markets, they would need scientific advice to improve their efficiency and productivity (Brooking 1996). Also, quality control was necessary to ensure that produce arrived at its overseas destination in uniformly good condition (Brooking 1996).

The colony's natural abundance had declined alarmingly as grain growing exhausted soil fertility and overgrazing reduced the nutritional value of native grasses (Brooking 1996). Droughts in Marlborough, Canterbury and Otago had increased during the 1880s (Brooking 1996), and there was a scourge of rabbits to contend with. Previously, large private organisations like the New Zealand and Australian Land Company had pioneered developments in breeding and farming technology, and had been key

players in promoting refrigerated shipping (Brooking 1996). Although wealthy landowners had endowed Lincoln Agricultural College in 1872 (Brooking 1996), the institution suffered from chronic underfunding (Brooking 1996). Agricultural and Pastoral (A and P) Associations and Farmers' Clubs also tried to disperse knowledge, but they had quite small memberships (Brooking 1996).

McKenzie wrote to the United States, Canada, Britain and Australia, where departments of agriculture had already been established, for information (Brooking 1996). He also consulted with the Parliamentary Stock Committee and A and P Associations (Brooking 1996). McKenzie was spurred into action by enthusiastic responses to a circular he sent to the A and P Associations, and firm support for the establishment of a department of agriculture in New Zealand. On 31 March 1892, he set up the Department of Agriculture by combining the Stock and Agricultural Branches from the Colonial Secretary's Office and the Crown Lands Department (Brooking 1996).

The objectives of the Department of Agriculture were to assist farmers and pastoralists to maintain and increase production levels, and to improve standards in order for New Zealand to compete successfully on the world market (Nightingale 1992). Scientific knowledge that enabled increased production was to be translated into practical advice for the landholder. J.D. Ritchie, the Chief Inspector of Stock and an experienced farmer, became the first Secretary of Agriculture (Nightingale 1992). Permanent staff numbers rose rapidly, from 83 in 1892 to 371 in 1910 (Nightingale 1992). The system of livestock inspection and quarantine was already in place, and in late 1892 the first two veterinarians were employed (Nightingale 1992). Six more were hired in 1898, and by 1901 there were 31 (Nightingale 1992). In 1900, B.C. Aston became Agricultural Chemist (Nightingale 1992). His role was to analyse soil samples, find soil deficiencies and recommend fertilisers to farmers. By 1910, nine experimental farms had been established (Nightingale 1992).

5.3 LAND TENURE

In the first two decades of the 20th century, the small farmer rose to a position of prominence in the New Zealand economy and politics, and high-country runholders were no longer able to dominate politically as they had done in the past. The upswing in agricultural prices brought about a new phase of upward mobility (Hatch 1992). The social divide between runholders and farmers narrowed (Hatch 1992).

5.3.1 Leasehold v. freehold

The debate concerning leasehold and freehold forms of land tenure became the foremost political issue of the 1890s. By this time, the colony's best land had already been made freehold. Land in the South Island high country was still mainly leasehold (Condliffe 1959).

Liberal politicians John Ballance, Robert Stout and John McKenzie became leaders of the moderate 'leasehold group', recommending that

the Government hold on to as much remaining Crown land as possible and resume control of some private land held by absentees, banks or companies (Brooking 1996). They always argued for fair compensation. According to this viewpoint, long or perpetual leases were more secure than freehold.

A practical argument in favour of the leasehold option was that capital could be used for improvements rather than for repaying mortgages (Brooking 1996). If state rents were low, capital would be available for stocking, fencing and cultivating properties. Long leases also provided protection against eviction and gave holders the confidence to plan long term and to make improvements (Brooking 1996). According to Brooking (1996), there were no major protests about the leasehold system until after 1900, when land values began to rise.

In contrast, freeholders argued that land ownership provided the greatest level of security and independence, and greatly benefited the community (Brooking 1996). Like the agricultural reformer Arthur Young, they believed that whereas a man with secure possession of a bleak rock would transform it into a garden, the same individual given a 9-year lease would convert it into a desert (Brooking 1996). (The fate of the Mackenzie Country seemed to prove his point.) New Zealand freeholders and champions of that option believed that the freehold system had the power to transform the environment in a way that the leasehold did not and that the yeoman farmer who worked with this tenure was the best citizen of all because of his independence, self-respect, industry, frugality and foresight (Brooking 1996).

Everyone agreed that those who used the land most efficiently and farmed it well had the foremost legitimate legal and moral claim to ownership (Brooking 1996). Absenteeism, or treating the land as a neglected speculation, was widely scorned (Brooking 1996).

5.3.2 Liberal Government policies

In 1891, the Liberal Party was elected on a platform of: closer settlement by allocation of Crown land to farmers, not speculators; the extension of leasehold rather than freehold land tenure; the repurchase of large estates for subdivision by the Crown; the introduction of a land tax to break up large estates in the high country and elsewhere; and cheap finance for the improvement of new farms (McLintock 1966). That same year, the property tax was replaced by a flat tax on all land valued at over £500, and a graduated tax on land worth more than £5000 (McAloon 2002).

The Land Act 1892 brought in the lease-in-perpetuity for 999 years, which was almost equivalent to the freehold system. As a compromise between advocates of leasehold and freehold tenure, it gave the State the power to control land aggregation and initial residence, and the lessee the opportunity to secure occupation at low rent (McLintock 1966). The Act was designed to place settlers of limited means on the land and to prevent the amalgamation of large holdings. It opened up rural lands for selection under the optional system. This meant that the selector (i.e. person choosing the land) could decide to purchase land for

cash, take an occupation-with-right-of-purchase licence, or take a lease-in-perpetuity (McLintock 1966). No selector could hold more than 640 acres (259.2 ha) of first-class land or 2000 acres (810 ha) of second-class land, inclusive of any land already held. If the land was purchased for cash, certificate of title would be issued after 7 years only if specified conditions had been met. The licence for occupation-with-right-of-purchase tenure was for 25 years, the yearly rental was 5% of the cash price, and the right to freehold tenure was allowed only after the tenth year. The lease-in-perpetuity had no option to freehold land, and the yearly rental was 4% on the capital value of the land (Jourdain 1925). The aggregation of large areas of Crown leasehold land was discouraged by restricting the area of one run to 20 000 acres (8100 ha), and by prohibiting a freeholder or leaseholder of 1000 acres (405 ha) of land or more from selecting a run under small-grazing-run tenure. Pastoral runs were divided into two types: pastoral lands suitable exclusively for pasturage, and pastoral-agricultural land suitable for subdivision in areas not exceeding 5000 acres (2025 ha). Like its predecessor in 1885, the Land Act 1892 provided for village and special settlements, and then the Land for Settlements Act 1892 authorised the Government to purchase land for closer settlement (Jourdain 1925).

Compulsory purchasing power and the use of loan money to buy land was authorised by the Land for Settlements Act 1894. Land was to be taken up either by lease-in-perpetuity or small-grazing-run lease, with rents fixed at 5% of the capital value of the land. In the same year, the Advances to Settlers Office was established, to give farmers access to credit that was cheaper and more extensive than that provided by stock and station agents, trading banks and private lenders (McLintock 1966).

A number of vendors of land in the high country and on the plains and foothills were heavily mortgaged and wanted to sell anyway to relieve their financial problems (McAloon 2002). Most vendors sold willingly; therefore, compulsory purchase under the Land for Settlements Act 1894 was relatively rare and usually unnecessary (McAloon 2002). Compulsory acquisition in Canterbury and Otago appears to have been invoked only against especially noticeable magnates and it was sometimes used to force stalled negotiations (McAloon 2002). For instance, the trustees of Cracroft Wilson's estate offered the 25 000-acre (10 125-ha) Culverden property to the Government in 1908 for £6 per acre, but after protracted negotiations had broken down, they received £4 2s compulsorily (McAloon 2002). Historian Jim McAloon commented that 'Invoking compulsion against a prominent land owning family may have been attractive with an election approaching and a need to demonstrate a continuing commitment to the agenda of 1890' (McAloon 2002: 133).

Another historian, J.B. Condliffe (1959), argued that whereas the aggressive intervention instigated by John McKenzie (Minister of Lands in the Liberal Government) loosened the grip of the land monopolists initially, it was the prevailing economic situation from 1895 that did most to create an environment conducive to closer settlement. When the Long Depression ended, productivity increased and price levels rose. Crown tenants who had been placed on the land by McKenzie's leasehold policies had begun

to clamour for the freehold option (Condliffe 1959). Condliffe contended that the main reason for the freehold agitation was 'the desire to be free from government restrictions in order to participate in the speculative land-selling that began after the turn of the century to dominate farming in New Zealand' (Condliffe 1959: 255). Although the advantages of the leasehold system were great, especially the freeing of the tenant's capital for improvements and the dispensation from taxation, leaseholders were constrained by 'restrictions of area, occupation and improvement conditions, government oversight, and difficulties in the valuation of improvements' (Condliffe 1959: 256). Furthermore, Condliffe (1959: 256) argued that the 'lure of rising prices' proved most powerful.

Gardner (1956) also pointed out that as prosperity returned and land prices rose, selling became financially rewarding for runholders, and new settlers were able to purchase land with borrowed capital. 'World economic factors ... were ultimately more important than land legislation' in breaking up the great estates (Gardner 1956: 294). Some Amuri runholders sold when it suited them, whilst others established their sons on part of the original estates (Gardner 1956).

McKenzie pursued three main objectives: consolidating existing legislation; centralising administration; and making legislation more coercive (Brooking 1996). The huge Stock Act 1893 was an important example of consolidation. It incorporated sheep, branding, diseased cattle and rabbit nuisance acts (Brooking 1996). It also shifted control from local bodies to central government and empowered sheep, cattle and rabbit inspectors to add horses, pigs, dogs, poultry, canaries and pigeons to their sphere of interest. Brooking (1996) wrote that 'Inspectors operated as a kind of rural police. They could enter private property and fine "negligent" farmers' (Brooking 1996: 163). 'New Zealand's big estate owners and runholders had to follow Department of Agriculture directives whether they liked it or not. McKenzie's tightening regulation of farming practice provided both a means of reducing the power of the old oligarchs and of involving farmers in the new democracy' (Brooking 1996: 168).

In June and July 1895, a great snowstorm enveloped the South Island (Scotter 1965). The losses of sheep were so great that before the end of the year the Liberal Government introduced the Pastoral Tenants' Relief Act 1895 to ameliorate the damage done to leasehold runs (Scotter 1965). The need to suppress rabbits was an added incentive. Canterbury runholders, who lost 340 000 of their 780 000 sheep as well as horses and cattle, made 81 applications for relief (Scotter 1965). Relief was given in the form of remission of rent and of the sheep rate or an extension of the lease (Scotter 1965). Acland and Tripp were almost ruined by their losses (Scotter 1965). The Mackenzie Country suffered most (Scotter 1965). In the north, losses were not so heavy; in Amuri, on average one-third or one-quarter of the flock was lost (Scotter 1965). Applications under the Act were made by four Amuri runholders or managers and the Commissioner for Nelson Province reported that owing to the financial burden of rabbiting and to the low prevailing prices for wool, the runs had been worked at a loss for several years (Gardner 1956). Three of the applicants were granted substantial remissions and new leases on better terms.

5.3.3 State subdivisions

Cheviot

The Cheviot Estate, which encompassed the high country of the Lowry Peaks District, was the first to be subdivided under the Land Act 1892, and as such acquired immense symbolic significance in the colony (Gardner 1990). It was broken up in 1893 (Gardner 1990). The owner, William Robinson, had died on 9 September 1889. His 93 000-acre (37 665-ha) estate was valued at £324,729 soon afterwards (Gardner 1990). It was second in value in New Zealand only to G.H. Moore's Glenmark Station, also in Canterbury.

John McKenzie, Minister of Lands, decided to mix the freehold and leasehold tenures (Haythornthwaite 1982). The higher and more broken ground on the eastern and western sides of the estate was designated grazing land and split into larger farms ranging in size from 665 acres to 3068 acres (c. 269–1243 ha), while the undulating and flat land through the centre was to be agricultural. The homestead site was retained as a unit of 5058 acres (c. 2048 ha) and put up for sale. Nearby, an area of small sections was set aside to provide land for workers' settlements and for the township. Port Robinson was to continue to provide sea access to the township and district, and a village was established there as well (Haythornthwaite 1982). Village settlements were also set out at Domett, Mina, Phoebe and Spotswood. Through the centre of the estate and Cheviot, land was reserved for a railway (Haythornthwaite 1982).

McKenzie's vision of mixed tenures on the Cheviot Estate was not realised by the sales (Haythornthwaite 1982). The Crown lease-in-perpetuity and lease of grazing land proved too popular (Haythornthwaite 1982). In all, 20 788 acres (c. 8419 ha) were leased as grazing farms, pastoral leases and licences; 1435 acres (c. 581 ha) were leased in perpetuity as rural and village homesteads; and 41 sections of town and suburban land were sold for cash. The 5058-acre (c. 2048-ha) homestead block was sold back to Sir Charles and Lady Campbell (a daughter of William Robinson) for an amount much less than anticipated, the upset price of £25,000 (Haythornthwaite 1982).

Excluding the Mansion House Block, only 2% of the estate was actually put into freehold tenure. The remainder was leased from the Crown, mostly through the lease-in-perpetuity system (Haythornthwaite 1982). The Cheviot Estate Disposition Act 1893 fixed lease-in-perpetuity rents at £5 per annum on the capital value of the land and set certain conditions concerning cropping, grazing, burning, maintenance of ditches and hedges, and eradication of weeds. Absentee landlordism was not permitted and substantial improvements to the land were required (Haythornthwaite 1982).

New Land Acts

A Royal Commission to study the problem of land tenure in New Zealand, the results of which would have a direct impact on the South Island high country, visited Cheviot on 17 April 1905 to gauge the opinion of the settlers regarding the freehold system (McLintock 1966). The members reported back later in the year, but were unable to come to a unanimous decision on the question of land tenure (McLintock 1966). The majority of five members including the chairman advocated freehold, the minority of the other five members advocated leasehold (McLintock 1966). As a result of the report submitted by the majority, the Liberals under Prime Minister Joseph Ward revised land legislation in 1907, removing the lease-in-perpetuity option from the statute books and replacing it with one of renewable leases. Tenants, including those of high-country runs, were also given the right to purchase the land, and 7 million acres (2 835 000 ha) were to be designated as National Endowment Land (McLintock 1966). According to Condliffe (1959), the three acts revising land legislation were:

1. The Land and Income Tax Amendment Act 1907. This was intended to compensate for the cessation of costly repurchase and subdivision. It stiffened earlier graduated tax on the unimproved value of the land, so that the land tax system consisted of a flat tax of a penny in the pound of unimproved value, and an additional graduated tax.
2. The Land Laws Amendment Act 1907. This abolished the lease-in-perpetuity option and gave tenants in the high country and elsewhere the right to freehold land. It introduced 'renewable leases' for 33 or 66 years, with perpetual right of renewal on revaluation.
3. The National Endowment Act 1907. This preserved 7 million (later 9 million) acres (2 835 000 ha; later 3 645 000 ha) as an endowment in perpetuity, to be disposed of only on leasehold tenures. But the land, which ran along the eastern side of the high country, was poor, and the plan that the net revenue should go to education and old age pensions proved illusory as insufficient funds were acquired.

Freehold advocates continued to agitate for the freehold option and finally gained the ascendancy after the election of William Massey as Reform Prime Minister in 1912 (Haythornthwaite 1982). Under the Land Laws Amendment Act 1912, the holders of leases-in-perpetuity were given the right to purchase the fee simple (land with unrestricted rights of disposal) either for cash or deferred payments. In 1913, the right to purchase the fee simple was extended to lands, including those in the high country, that came under the Lands for Settlement Act 1894, but Cheviot Estate was excluded (Haythornthwaite 1982). Cheviot leaseholders would not be able to purchase the fee simple until 1928, when the Land Laws Amendment Act was passed (Haythornthwaite 1982).

Why were the tenants of Cheviot the last to obtain the right to purchase their freehold lands? D.W.R. Haythornthwaite (1982) argued that politicians were chary of tinkering with the first major experiment in land reform in New Zealand. Also, the fact that the 1928 amendment was passed

immediately before an election indicates that Cheviot was being used for political gain yet again (Haythornthwaite 1982).

Gardner remarked that:

> 'A striking long-term feature of ... Cheviot is that so much of it survived and flourished without marked change, or could easily be adjusted to economic trends ... The settlement became stronger as a farming district and as a community based around families holding the same farms generation after generation. The Cheviot settlers began with a nineteenth-century blueprint and soon made it into a twentieth-century farming enterprise.' (Gardner 1992: 189–190)

He reflected that 'the main social significance of Cheviot was that it revealed in a new way the nature and extent of land hunger in Canterbury, and to some degree elsewhere in the South Island' (Gardner 1992: 193). The settlement was founded in two of the worst years of depression and the Advances to Settlers Department helped many of the successful settlers, who at the time were heavily mortgaged, to pull through (Gardner 1992). Cheviot settlers, however, gained one enormous boost from the depression. They were able to stock their farms cheaply in 1894 because sheep prices were low and the Culverden sheep yards were nearby. 'Amuri runholders thus contributed to the establishment of the small men whom McKenzie intended should supplant them', wrote Gardner (1992: 201).

Otekaike

The Canterbury landscape had been changed dramatically by government subdivision. By 1914, the Liberal Government had placed 1702 selectors on farms (Scotter 1965). However, the greatest concentration of estates bought up and subdivided was in North Otago and the Waimate District (McKinnon 1997). Ben Lomond and much of Station Peak were taken back by the Government in 1890. Most of Otekaike Station remained intact until the early 20th century. By May 1905, petitions were circulating urging the Government to take over the estate for closer settlement (Hall 1985). In December of the same year, the Government announced that the Otekaike Estate would be resumed for settlement (Hall 1985). The price paid for 17 495 acres (c. 7085 ha) of freehold land was £97,359.

Otekaike Station was one of the first estates to be settled under the provisions of the 1907 legislation that brought in renewable 33-year leases of rural and pastoral land. The estate was offered for settlement in 1908 (Hall 1985). It was subdivided into seven small grazing runs (varying in size from 998 acres to 12 364 acres; c. 404–5007 ha), 37 farms (58–817 acres; c. 23–331 ha) and 12 smallholdings (10–40 acres; c. 4–16 ha). The big homestead became a 'School for Defectives' (Hall 1985).

Later, the Government acknowledged that it had blundered in two areas (Hall 1985). Firstly, by trying to place as many people as possible onto the properties, it made them too small. Secondly, when setting capital values and rents for the properties, the government assessors had taken

insufficient note of weather extremes. Although the land was mostly good quality, the Otekaike settlement was exposed to the full brunt of the northwesterly winds that sweep down the Waitaki Valley (Hall 1985). The new settlers were immediately confronted by drought and rabbits (Hall 1985). Under the terms of their leases, they were not permitted to transfer title for 5 years. In 1913, these settlers began selling as soon as they could (Hall 1985). Almost all the properties were sold. By late 1920, there had been a turnover of 60% of the original settlers, and between 1913 and 1920, 92% of the land changed hands (mostly in 1913 and 1914). On average, runs were held for 8 years, farms for 15 years and smallholdings for 16 years (Hall 1985).

Canterbury high country

Most of the Canterbury high-country leases were due to expire in March 1912, and before this time the Liberal Government had commissioned the three experts Flanagan, Haszard and Stevenson to inspect the runs and suggest any improvements in their management (Flanagan et al. 1910). While the commissioners were aware that to 'extend the principle of close settlement to high pastoral country would be to court disaster', their aim was 'to secure the occupation of the back country in moderate-sized holdings on sound and safe lines' (Flanagan et al. 1910: 3). After inspecting runs in the upper Ashburton, Rakaia, Selwyn and Waipara River districts and the Amuri area, they advised that the two Double Hill leases, which extended for 24 miles (c. 38.6 km) along the Rakaia River, be subdivided and that Glynn Wye Station be carved into three runs. Other leaseholds were too cold, inaccessible, high or broken to be cut into smaller blocks. The commissioners recommended that the term of lease of the Canterbury pastoral runs be fixed at 14 years to allow for revision of the rental and for further subdivision (Flanagan et al. 1910). Developments in transport meant that 'the back-country of today is the front-country of tomorrow', they wrote (Flanagan et al. 1910: 3). Thirteen of the runs were offered at auction in Timaru on 28 February 1911, and the other 14 were balloted (Whelan 1988). Of the latter, seven changed hands within the first 3 years (Whelan 1988), reinforcing the message that insecurity of tenure discouraged competent land management (Whelan 1988).

Duncan Rutherford was disappointed that the Department of Lands and Survey refused to renew his lease of Glynn Wye, which was due in February 1912 (McCaskill 1970). Instead, the department had made provision for a subdivision to take effect from March 1912 (McCaskill 1970). (The run was split into three blocks called 'Glynn Wye', 'Glenhope' and 'The Poplars'.) Rutherford then decided to take up Molesworth Station. He circumvented the Land Laws Amendment Act, 1907, which stated that no person could hold more than one run except on the recommendation of the Land Board and with the approval of the Minister of Lands, by leasing Tarndale-Rainbow to himself and Molesworth to his wife, Eva, from August 1911 (McCaskill 1970). Consequently, despite the new legislation, the entire block continued to be managed as a unit.

On 3 million acres (1 215 000 ha) of Canterbury high country, there were 94 pastoral leases in 1896, 150 in 1903 and 129 in 1914 (Scotter 1965). The process of division is shown by the steep rise in the number of small grazing runs. In the first year in which a small grazing run was leased under the Land for Settlements Act, 1896, there were 59 runs, of which 18 were on Cheviot (Scotter 1965). By 1914, there were 145 runs, of which 44 were on settlement land (Scotter 1965). The average sizes of the high-country pastoral runs were 26 000 acres (10 530 ha) near the main range and 22 000 acres (8910 ha) in the easterly areas. The small grazing runs averaged 2636 acres (c. 1068 ha)—those on settlement land reduced the average considerably (Scotter 1965). The working of these small grazing runs, especially those outside the settlement areas (which were more difficult to supervise), were becoming a problem (Scotter 1965). The grazing capacity of the country was being badly affected by rabbits, ill-advised burning off and overstocking. The term of the new leases was fixed at 21 years to encourage tenants to care more for their land; the public and political pressure to subdivide was resisted as much as possible; and improvement conditions were attached to the licences (Scotter 1965). Most runholders followed one of the conditions by planting trees (Scotter 1965).

Regardless of the subdivisions, there were still some extensive areas: Glynn Wye Station, 27 000 acres (10 935 ha); Glenhope Station, 55 000 acres (22 275 ha); The Poplars Station, 108 000 acres (43 740 ha); and National Endowment Lands, 1 500 000 acres (607 500 ha). The National Endowment Act had one remarkable effect in Canterbury: it hedged in the freehold land with a band of high-country reserves along the eastern ranges of the Main Divide. The land behind it was almost exclusively either high-country Crown leasehold land or educational endowment land, such as Mesopotamia, for the benefit of separate institutions (Scotter 1965).

Kaikoura

In Kaikoura, closer settlement schemes could not be initiated by the Liberals until the leases of large blocks of Crown high-country land expired. In 1896, survey parties moved onto the leasehold portions of the Kahutara and Amuri Bluff Runs (Sherrard 1966). Runholders were bitter and sceptical about the financial viability of constructing a costly road from the Conway River to the Kahutara River for a few settlers whose farms had to be cut out of steep bush country (Sherrard 1966). In spite of such fears, the subdivision proved very lucrative, but only after the settlers experienced backbreaking work, primitive living conditions and many setbacks (Sherrard 1966).

Almost 30 000 acres (12 150 ha) in the Hundalee Survey District were broken up into 12 small grazing runs, ranging from 1500 acres to 4000 acres (607.5–1620 ha) in area, containing a mix of high- and low-country land, and accessible from the Kaikoura–Waiau road, the Kahutara and Cribb River beds or, until the coast road was opened in 1900, the

boat landings at Omihi and Goose Bay (Sherrard 1966). The following is an example of a Land Office advertisement:

> 'Small grazing Run No. 88.—All hills, part ploughable; well watered; northern aspect; soil varies from good to poor and stony; 50 acre paddock ploughed and in English grass (good homestead site), balance tussock and fern; 100 chains wire-and-standard fencing on south boundary, and 224 chains within the section. Altitude, 400 ft to 3000 ft. Distant 13 miles from Kaikoura.' (Sherrard 1966: 214)

These runs could be leased for a term of 21 years with the option of renewal for a similar term. The rent was to be not less than 2.5% of the capital value. Tenants were to live on the property and make permanent improvements of a specified value. They had no right to purchase the land but could select 150 acres (60.75 ha) around their homesteads through which no road could be taken without compensation (Sherrard 1966).

In late 1899, reserve land south of the Hapuku River was cut into ten sections for lease on 14-year terms (Sherrard 1966). The Stag and Spey Block was offered next, but the sections and runs were too small to be profitable (Sherrard 1966). Situated at 1000–1500 feet (304.8–457.2 m) above sea level, it was cold country—too cold for the crops and improved pastures of the first selectors (Sherrard 1966). It was also difficult to find sheep. Most settlers left after short tenancies (Sherrard 1966).

The Waipapa subdivision got off to a shaky start. Small grazing runs 107, 112 and 113 were balloted on 8 January 1902 (Sherrard 1966). Within 6 months, run 107 was surrendered so that it could be regrouped with runs 108, 109 and 113 (Sherrard 1966). The tenants of the latter three had walked off the land by the end of 1902 because of difficult access, rabbit infestation, the high prices of stock and fencing, and the low stock carrying capacity of the land (Sherrard 1966). One observer noticed that run 113 was infested with rabbits, much of it was bare, all vegetation on the lower slopes had been destroyed, and the burnt bush near the point of the peninsula was seething with rabbits (Sherrard 1966). By 1906, the Waipapa subdivision had £6,103 worth of improvements, five homesteads and 21 residents (Sherrard 1966).

In April 1902, government advisers declared that almost all suitable Crown land in the district had been cut up and the Kaikoura Survey Office was closed (Sherrard 1966). In 5 years, 25 000 acres (10 125 ha) of better quality Crown land had been surveyed into 60 farms and a further quarter of a million acres (101 250 ha) had been split into 29 small grazing runs (Sherrard 1966).

5.3.4 Statistical overview

Between 1893 and 1906, the areas acquired for closer settlement by the Liberal Government in the South Island were Marlborough–Awatere, 110 658 acres (c. 44 816 ha); Amuri–Cheviot, 137 743 acres (c. 55 786 ha); South Canterbury, 158 603 acres (c. 64 234 ha); North Otago, 71 483 acres (28 951 ha); and Southland, 54 183 acres (c. 21 944 ha) (Duncan 1962).

Across New Zealand, the area of occupied land had expanded from c. 20 million acres (c. 8.1 million ha) in 1891 to nearly 40 million acres (16.2 million ha) by 1901 (Roche 1994). Only a slow increase was recorded subsequently, with the total levelling off to about 45 million acres (c. 18.2 million ha) in the 1920s (Roche 1994). Geographer Michael Roche commented that this represented:

> '... in effect the closing of the agricultural frontier in New Zealand. The number of land holdings had increased markedly from less than 20,000 in 1891 to 40,000 by 1911. A land hunger was satisfied, but only by opening to settlement lands that in early years would have been deemed unsuitable by both the Crown and the prospective farmer.'
>
> (Roche 1994: 25)

5.3.5 Kai Tahu

Throughout the Liberal era, Kai Tahu continued their decline. Alexander Mackay had been appointed as Native Reserves Commissioner in 1882 and a Judge of Native Land Court in 1884. In his July 1891 report on Middle Island Native Claims, Commissioner Mackay described the despair of young Maori:

> 'Some of the younger men, when testifying as to the insufficiency of the acreage owned by them for the support of their families, remarked that it would be better for them all to die, as there appeared to be no future for them; every year they found it more difficult to find employment, and if the labour market was closed against them it would be impossible to live on the small parcels of land they possessed. Their fisheries, that used to afford them a slender assistance in providing food for their families, were for the most part destroyed by the drainage of the country or other causes, and other streams and rivers were now rendered unavailable through being stocked with European fish.' (Mackay 1891: 3)

Maori who were dependent on shearing and harvesting work for a livelihood were finding 'that the labour-market was gradually getting closed against them, owing to the competition that existed amongst the Europeans to secure work for themselves' (Mackay 1891: 4). Some lived off rents from lands let to Europeans, but many were in debt because they had drawn income 2 or 3 years in advance (Mackay 1891). The fertility of their plots of land was exhausted because they were unaccustomed to fertilising their land and, confined to their reserves, were unable to shift their cultivations to other places. When searching for supplementary food sources in the high country and elsewhere, Mackay (1891: 6) wrote that they 'cannot fish in the Waitaki for eels or whitebait, owing to the river being stocked with imported fish; and the runholders will not allow them to go over their country to catch woodhens or other birds in season'.

In 1892, the Liberal Government Native Minister Alfred Cadman promised that land for the settlement of the Kai Tahu claim would be fully investigated during the parliamentary recess (Evison 1993). The Liberal Government's offer in response to Kai Tahu claims was 100 000 acres

(40 500 ha) of vacant Crown waste land, including remote bush country in western Southland and Stewart Island/Rakiura (Evison 1993). None of this land was in Kemp's Block or the Otago Block.

In December 1893, the Government asked Judge Alexander Mackay and the Surveyor General, Stephenson Percy Smith, to begin working on Cadman's scheme (Evison 1993). Every Maori in the South Island was to be tabulated by name, ancestry and circumstances, and each entitlement assessed in terms of acres, to a maximum of 50 acres (20.25 ha) per adult and 20 acres (8.1 ha) per minor. The task was to take Mackay and Smith 12 years, with much of the work done in their spare time (Evison 1993). In 1894, they were joined by Kai Tahu leader and politician Tame Parata (Evison 1993).

In 1905, Mackay and Smith, who were both retired by that time, completed their work on the allocations of land for Kai Tahu (Evison 1993). They submitted a draft bill, which was the basis for the South Island Landless Natives Act 1906. The bill proposed that the Government be authorised to allocate land to landless South Island Maori in accordance with the lists that Mackay and Smith had submitted. The average allocation was 35 acres (c. 14.2 ha) per person, with the maximum set at 50 acres (20.25 ha) (Evison 1993).

By 1909, most of the titles to the land that was due to be allocated under the South Island Landless Natives Act 1906 had either been issued to their owners or were waiting to be uplifted (Evsion 1993). In 1914, it was found that although some of the land allocated to Kai Tahu had been occupied, most of it was mountainous, barren and so unsuited to farming that its future use was questionable (Evison 1993).

5.4 SUMMARY

5.4.1 General historical features

- Crown pastoral leasehold land was confined mainly to South Island high country
- Environmental problems of South Island high country: exotic grasses invaded it, stock overgrazed it, burning off caused erosion and rabbits reached plague proportions
- Most mahika kai destroyed
- Destruction of remaining forests continued through burning and sawmilling
- Refrigeration stimulated an increase in the number of small farms, some of which were in the high country; more meat, cheese and butter production; diverse sheep varieties bred; and exotic grasses and crops sown
- Wealthy runholders lived in grand houses and developed spacious grounds with tennis courts, croquet lawns, lakes, plantations and other features
- Great estates were subdivided

- State intervention became more intrusive and coercive; the power of the early runholding families diminished
- Stock numbers declined
- Average flock size decreased
- Mixed crop/livestock farming expanded on the plains and foothills
- A marked contrast emerged between the size of farms and density of the rural population in the steep hill country, and the flat, rolling lowlands
- Railways expanded and more bridges were built, facilitating and speeding up transport of high-country produce to markets and ports
- Freezing works were situated near railways and ports
- Evolution of the motorcar encouraged construction of better roads
- Telephone network expanded and communications improved
- Population drifted to the North Island
- Stock numbers in the North Island exceeded those in the South Island
- Scientific farming developed
- Maori ownership and association with the land continued to decline

5.4.2 Key physical resources

- Environmentally damaged high country
- Few surviving pockets of mahika kai
- Sawmills
- Grand homesteads
- Subdivided large estates
- Small settlements
- Small farms and medium-sized estates
- National Endowment Lands
- Land allocated to Kai Tahu
- Railways, roads, bridges and telephone lines

6. 1912–1935: Increasing importance of science, technology and soil conservation

6.1 LANDSCAPE MODIFICATION

The period from the 1920s through to the 1960s was notable for the increasingly intensive application of science and technology to farming problems. The State intervened more frequently, producer boards were established, production chains were set up in freezing works and science was employed to boost farm production (Roche 1994). However, while total production rose in the 1920s and 1930s, the signs of localised environmental degradation became more obvious and were defined variously as 'land deterioration', 'land depletion' and 'soil erosion' (Roche 1994). The cumulative effect of over 50 years of high-country pastoral farming combined with more recent occupation of lands that had previously been rejected as unsuitable for farming was starting to show (Roche 1994).

6.1.1 The 1920 Southern Pastoral Lands Commission

Serious erosion problems in certain parts of the South Island high country—i.e. Crown pastoral leasehold tussock lands—attracted a great deal of attention in the early 20th century (Roche 1994). Evidence of forced reductions in stock numbers began to emerge (Roche 1994). For instance, sheep numbers on Galloway Station in Central Otago had declined by 63% between 1879 and 1910 (Roche 1994). In 1920, the Southern Pastoral Lands Commission was appointed to investigate the extent and causes of land depletion and deterioration on Crown pastoral lands in the high country of Canterbury, Otago, Southland and Marlborough (Roche 1994). The commissioners defined 'depletion' as the elimination of virtually all grassland species, resulting in a predominance of bare ground in the worst cases, and 'deterioration' as reduced palatability through the destruction of edible plants and an increase in unpalatable plants (Sadd et al. 1920). The eight members of the Commission included Commissioner of Crown Lands and Chief Surveyor for the Otago Land District, R.T. Sadd; leading botanist Leonard Cockayne (father of Alfred); Christchurch land valuer W.B. Buckhurst; Dunedin stock and station agent Charles Todd; and several farmers (Sadd et al. 1920).

Between April and June 1920, the Commission travelled extensively throughout the South Island and its high country. Beginning at Invercargill, its members went through the Aparima Valley to Mossburn, and by coach road to Lake Manapouri—observing the depredation caused by rabbits to the tussock grasslands—and then on to Lumsden (Sadd et al.

1920). There they caught the train to Kingston, taking the steamer on Lake Wakatipu to Queenstown. Next they crossed the Waimea Plains to Gore, Switzers and Greenvale Station at the base of the Black Umbrella Mountains: 'We examined the pasture *en route* and were struck with the large amount of country rendered worthless through the spread of manuka. We also noted that the sweetbrier was likely to become dangerous' (Sadd et al. 1920: 5). They travelled on to Tapanui, observing 'the beneficial effect of close settlement where there had originally been large holdings', and then to Dunedin, visiting the Conical Hills Plantation on the way (Sadd et al. 1920: 5).

Journeying in motorcars to Lawrence, Roxburgh and Alexandra, on the road to Fruitlands, the commissioners:

> '... were at the average northern limit of the south-western rainfall, and observed on the one side the well-grassed Old Man Range, and on the opposite side of the River Clutha the depleted area of part of Central Otago. We also saw the extensive orchards planted a few years ago by the Fruitlands Company on ground which has suffered considerable depletion.' (Sadd et al. 1920: 5)

Driving to Cromwell, they visited 'first the striking example of dry farming conducted by Mr. Barker, and next the power-house on the Fraser River', investigating the supply of water for irrigation (Sadd et al. 1920: 5). They went on to Northburn Station, where 'we had an opportunity of carefully examining the experimental plots designed by the Department of Agriculture with the view of finding out some of the fundamental principles on which the regrassing of the depleted areas depends' (Sadd et al. 1920: 5–6).

After going through the Kawarau Gorge to Arrowtown, at Lake Hayes and near the gorge of the Arrow River they noticed 'a new pasture weed, hitherto unrecorded for New Zealand—one of the American meadowsweets' (Sadd et al. 1920: 6). The commissioners warned that this plant 'should be at once eradicated so as to prevent its further spread' and noticed 'the spread of that truly noxious weed, St. John's wort (*Hypericus perforatum*)' (Sadd et al. 1920: 6). When passing through the Crown Range on the way to Pembroke, 'A short stay was made on the summit, and the effect of burning the snow-grass and so encouraging the growth of unpalatable plants was observed' (Sadd et al. 1920: 6). In Cardrona Valley, 'the bad effects of burning at the wrong season' were noted (Sadd et al. 1920: 6). They went to Pembroke and Glen Dhu Station, 'where ground originally covered with fern was now growing luxuriant cocksfoot and red clover', past Lake Hawea and across the Hawea Flat to Tarras, observing irrigation works and plantations of gums and turnips (Sadd et al. 1920: 6). The Department of Agriculture's experimental plot at Clyde was studied, as well as experimental tree planting and regenerating pasture in an enclosure on Galloway Station. They went on to Naseby through the Ida Valley, 'seeing the splendid result of irrigation in that district, where a depleted area has been turned into dairying-land', and to Ranfurly, Middlemarch, and then Dunedin via the Rock and Pillar Range and the Taieri Plain (Sadd et al. 1920: 6).

They next went by train to Kurow, inspecting the Hakataramea Valley pastures, and on to Omarama, 'noting *en route* some fine crops of lucerne in the Waitaki Valley, and how, near Omarama, there was on parts of the mountains depletion not unlike that of the worst part of Central Otago' (Sadd et al. 1920: 6).

In Canterbury, the Commission visited The Hermitage at Mount Cook, 'seeing the Benmore country, and near Lake Pukaki, on Ben Ohau and Rhoboro Downs, the runs recently set aside for settlement of soldiers' (Sadd et al. 1920: 7). They examined 'the high mountain grassland on the Sealey [*sic*] Range, which is in its absolutely virgin condition, with abundance of blue-grass and aniseed (*Angelica montana*), a herb eaten out of sheep-pastures in general' (Sadd et al. 1920: 7). Proceeding to Lake Tekapo and Fairlie via Burkes Pass, the following was noted:

> 'Between Tekapo and Burke's Pass we noticed that the depletion was the effect of the tussock dying out through some cause other than that of the rabbit or burning – possibly the grass-grub. A good deal of depletion in dry areas arises from this cause.'
>
> (Sadd et al. 1920: 7)

The commissioners then went to Timaru, Geraldine, Ashburton and by train to Christchurch.

After inspecting the hydroelectric works at Lake Coleridge and tussock grassland on the Lake Coleridge Run, the commissioners continued on to Hanmer, seeing along the way 'the fine tussock-grassland of the Waiau Valley', to 'the lower part of Jack's Pass Valley, where, in many places, European grasses have naturally replaced tussocks' (Sadd et al. 1920: 7), to Culverden, Waiau and 'to Kaikoura by way of the coastal road, snow having hindered us going by the Whalesback Road ' (Sadd et al. 1920: 7). The great spread of fern and manuka near Hunderlee was noted.

In Marlborough, the commissioners were 'greatly struck ... with the excellent lucerne and with the danthonia pastures, this grass having in many places replaced the tussock altogether' (Sadd et al. 1920: 7). They went to the Waiau Valley, 'here again noting the value of close settlement on Erina and Hillersden' (Sadd et al. 1920: 7).

The Commission then split three ways: three members went to Cheviot, Cockayne went to Wellington, and the rest went to Benhopai to inspect the grassland. Finally, some reviewed irrigation at Alexandra, the depleted areas and dry farming in Central Otago, the countryside in the Clutha, Tarras and Northburn Valleys, the Galloway experimental station, and Lauder Station 'where Mr. John Wilson was interviewed in regard to his methods of irrigating grassland—he having had thirty years' experience in this work both with miners' water and with clear water' (Sadd et al. 1920: 8). After visiting Ophir and Ida Valley, the 'travelling sub-committee' proceeded to Naseby via Puketoi, to Linburn Bridge on the Maniototo Plain, Patearoa, Waipiata, Pigroot, Dunback and Palmerston South (Sadd et al. 1920: 8).

In their report, the commissioners pointed out that high-country pastures lacked uniformity (Sadd et al. 1920). There were extreme

ranges of climate, and soils varied greatly in fertility, especially those overlaying greywacke and those of mica-schist. Because there was an eastern limit to the northwest rainfall and a northern limit to the southwest rainfall, some pastures were wet and some were dry; and those exposed to the southwest were vulnerable to snowfall (Sadd et al. 1920). While mica-schist soils were extremely fertile, soils overlaying greywacke were far poorer, disintegrating easily and forming shingle slips (Sadd et al. 1920).

In Central Otago, although the mountains were exposed to rain from all directions, the river valleys, intermontane basins and lower hills were extremely dry. Other dry areas were the Mackenzie Country in Canterbury, and the Clarence and Awatere Valleys in Marlborough (Sadd et al. 1920).

The commissioners also noticed that there was a variety of tussock types, and that their correct identification was of great importance in determining the feeding value of a pasture (Sadd et al. 1920). The different types were: snow tussock, fescue tussock, tall blue tussock, blue grass, small blue tussock, snow grass and red tussock. As well as the tussocks, in the mountainous sheep pastures of the high country there were at least 300 indigenous and some 40 introduced plants, mostly European. Of the indigenous plants, only a dozen had any feeding value (Sadd et al. 1920). Especially aggressive indigenous unpalatable plants were piripiri, allies of the scabweed, especially the turfy raoulia, the mountain twitch, the mountain cotula, the Maori onion, and the common cotton plant. Spreading indigenous shrubs were the mountain tauhina and manuka. Invasive introduced plants were the sweetbriar, especially in drier areas, and bracken fern in wet areas such as Lake Wanaka and Lake Wakatipu (Sadd et al. 1920).

The key causes of soil deterioration and depletion in the high country were listed by Sadd et al. (1920) as:

- Burning the tussocks, especially at the wrong time of year
- Overstocking with sheep
- Continuous grazing for 70 years without any attempt at improvement
- Allowing rabbits to become extremely numerous (the most potent cause)
- Land tenures and some of their conditions

Deterioration was observed in all land districts. Declining sheep returns showed that gradual deterioration had been occurring for many years (Sadd et al. 1920). In one extreme case (Vincent County), sheep numbers had declined from 511 188 in 1880 to 315 757 in 1919 (Sadd et al. 1920). Whereas lowland farming had leapt forward, high-country sheep grazing had gone backwards (Sadd et al. 1920).

Indiscriminate burning and extremely dense stocking had caused great changes in the high-country landscape, notably an increase of unpalatable plants on ground that had been denuded by burning, and erosion caused by the exposure of bare ground. It was noted that had it not been

for the invasion of foreign grasses of higher palatability, the pastures would have been in much worse condition (Sadd et al. 1920). In the early 1880s, rabbits had begun to infiltrate the high country, and dry areas were turned into bare ground or taken over by unpalatable plants. Depletion had taken place to such an extent in the driest area—the upper Clutha River basin of Central Otago—that between an altitude of 170 m and 800 m the country was like a desert: 'There, instead of waving tussocks, as in the early days of settlement, the landscape, as far as the eye can pierce, consists of bare hills looking like huge sand-dunes' (Sadd et al. 1920: 15).

Depletion was most apparent in parts of Central Otago, the Mackenzie Country, the upper Waitaki Valley, and the Clarence and Awatere Valleys, where much scabweed was evident, the slopes of the Rock and Pillar Range, and the greywacke mountains of Canterbury and Marlborough (Sadd et al. 1920).

According to geographer Kenneth Cumberland, nature exacted its revenge from the early 1920s (Brooking et al. 2002). Around 14 million acres (5.67 million ha) of English grasses had been laid by 1911, but productivity dropped drastically once the original fertility had gone (Brooking et al. 2002).

In 1928, the Christchurch Fields Superintendent for the Department of Agriculture, R. McGillivray, noticed that a tussock that was not palatable to stock was aggressively displacing native tussock in the high country (Nightingale 1992). This *Nassella* tussock of Argentinian origin was positively identified in 1934, and had already spread across Canterbury and Marlborough, proving difficult to eradicate by traditional methods such as grubbing (Nightingale 1992). By the 1940s, it dominated the high-country tussock land in the Waipara area of North Canterbury, and in 1946 the Nassella Tussock Act was passed to control it by spraying (Nightingale 1992).

During this period, individuals, acclimatisation societies and governments continued to introduce wildlife (Grey 1994). Changes to high-country waterways were most pronounced with the influx of trout and salmon. Some of the most successful importations were made by the State (Grey 1994). From 1900, salmon were introduced to the Waitaki, Hakataramea, Rakaia, Rangitata and Waiau Rivers (Grey 1994). Many organisations, including the Government, carried on importing and protecting various fish, animals and plants until well into the 1920s. The desires of recreational hunters and anglers, especially those from overseas, and sentiment and aesthetics were called upon to justify such action (Grey 1994). For example, new grazing and browsing animals were brought in to enhance big game hunting: chamois and tahr at Mount Cook, and moose and wapiti in Fiordland (Grey 1994). These contributed to the list of already established pests such as rabbits and Australian possums, which were brought in to develop the fur trade (Grey 1994).

In 1936, Herbert Guthrie-Smith, the owner of Tutira Station in Hawke's Bay and also a naturalist, expressed a view that was an exception rather

than the rule. He wrote despairingly of his own kind: 'the squatters are a class accurst in that the ravishment of the Dominion has been their handiwork' (Guthrie-Smith 1936: 16). Worse still, the 'ravening energy of the Anglo-Saxon breed, its ferocious rat-like pertinacity has accomplished the ruin of a Fauna and Flora unique in the world—a sad, bad, incomprehensible business' (Gurthrie-Smith 1936: 16). As both a runholder (albeit in the North Island) and a naturalist, he personally felt torn:

> 'Alas! too, for the conflicting moods of even the writer himself, but though sometimes pluming himself as superpatriot on the thousand blades of grass created by him where less than none had grown, he can state honestly that oftenest he deems himself unfit to live.'
>
> (Guthrie-Smith 1936: 16)

6.2 PHYSICAL REMAINS

Through to 1921, although runholders continued to dominate in the high country, agricultural products brought such good prices that small farmers made a very good living, and generally throughout New Zealand their numbers expanded to the extent that they replaced runholders as the major land users (Hatch 1992). As stated in section 4 (the Liberal era), for the first time in New Zealand, small farmers became economically and politically dominant. This was because of the agricultural recovery from the mid-1890s, the expansion of refrigerated shipping and the increase in the number of small farms (Hatch 1992). By 1914, intensive agriculture had become more important to the economy than extensive pastoralism, and the amount of land devoted to extensive grazing and the ratio of pastoralists to farmers was declining (Hatch 1992).

Although the possession of extensive sheep runs no longer gave high-country pastoralists the economic and political status they had enjoyed up to the 1890s, their lifestyle continued to mark them off from the farmers, who were situated mainly on the foothills and plains (Hatch 1992). Until the 1920s, the most wealthy runholders had servants, entertained house parties for hunting and other sporting activities such as tennis, and sent their children away to boarding school in New Zealand or abroad (Hatch 1992). However, some of the more prosperous farmers also began to send their children away to boarding school and to hire maids (Hatch 1992). Anthropologist Elvin Hatch remarked: 'the markers of social distinction between the elite run-holder and farmer were being effaced' (Hatch 1992: 33). Farmers and runholders started to mix in social and sporting events (Hatch 1992).

While the economic position of the farmer improved greatly through to 1921, that of the worker did not (Hatch 1992). Whereas the gap between farmer and runholder narrowed, that between farmer and worker widened. Increasing mechanisation meant that the wages of working men stayed low, jobs were often insecure and in many cases their living

conditions had changed little since the Long Depression of 1879 to 1895 (Hatch 1992).

While the farming industry prospered from the time of the economic recovery of the mid-1890s until 1921, between 1921 and 1930 a series of recessions and recoveries occurred, and from 1930 to 1935 depression prevailed (Brooking 1996). Dependence on agriculture left New Zealand exposed to the drop in prices for primary production. In 1930, the overseas deficit rose astronomically (Brooking 1996). Farmers' incomes fell (Brooking 1996). However, the continuing importance of wool secured the survival of pastoralists on large areas of land and they kept their place in the economy because much marginal high country could only be farmed in large units. Historian Tom Brooking wrote:

> 'The pastoralists assumed a lower profile than in previous years, especially in national politics. They cut their holdings and flocks back to more manageable levels, cashed in on rising land values through voluntary subdivision, invested in urban real estate, and continued in considerable comfort even though the ostentation of their earlier lifestyle was reduced.' (Brooking 1996: 233–234)

6.2.1 New technology

In the 1880s, traction engines and mechanically powered shearing machines had begun to appear (see section 5). By the early 20th century, the internal combustion engine began to make an impact: cars, trucks and tractors eased the work and isolation of many farmers (Brooking 1996). In the high country, however, difficulty of access meant that these inventions were not as widely used as on the hills and plains. Traction engines were used in the Mackenzie Basin from around the late 19th century (Whelan 1988). They were used to transport wool and supplies to and from the rail heads at Mount Somers and Alford Forest (Whelan 1990). Benmore was one of the earliest stations to begin mechanical shearing (Whelan 1990). A system of 28 Wolseley machines was installed in 1889. Water power was used to drive a turbine wheel, and 80 000 sheep were shorn.

In the late 20th century, the remains of the riveted iron water pipes and the turbine could still be seen on the western side of the woolshed (Whelan 1990). Motorcars were acquired by runholders from c. 1910 (Whelan 1988, 1990). Motor lorries appeared within a couple of years, and these and early tractors eventually replaced traction engines (Whelan 1988, 1990). The first motor lorries were not strong enough to carry loads from the most isolated stations until the 1930s. Roads were metalled over time (Whelan 1988, 1990).

6.2.2 Transport

Following the completion of the main trunk lines (1908 in the North Island; 1912 from Parnassus to Invercargill in the South), the Government began to focus on roads because increasing use of motorcars and lorries had made their development essential (Brooking 1996). Although motor vehicles began to make initial forays into the high country, bullocks and horses often remained the key means of getting wool to the nearest railhead or road. For instance, even in the 1930s the road to Molesworth Station was a tortuous track winding over the shifting shingle beds of the Awatere River. The last 15 miles (c. 24 km) between Langridge Station and Molesworth Station homestead was usually travelled on horseback because motor cars and lorries often became stranded in the icy waters of the river (McCaskill 1970). Once high-country produce reached the coast by road or rail, shipping remained an important mode of transport (Brooking 1996).

6.2.3 Mining

Extractive industries declined in importance in the high country and elsewhere in New Zealand. Although coal mining expanded initially to provide fuel for the spreading railway system, as rail construction slowed in the 1920s and the use of electric power grew, the industry lost its importance (Brooking 1996). Coal mining was carried out at Flock Hill and Avoca Stations in the Broken River area, Canterbury, between 1918 and 1928 (Ian Hill, DOC, pers. comm.). Gold was exported until the First World War, and there were many technological innovations, particularly in alluvial dredges and in quartz mine chemicals (Brooking 1996). Eventually, the gold ran out (Brooking 1996).

6.2.4 Electricity

Electricity began to reach rural areas in the 1920s (Brooking 1996), making life more comfortable for some farming families, but not for most runholders in remote high-country areas. Hydroelectric plants became more important than the earlier coal-fired stations (Brooking 1996). In 1911, Lake Coleridge in the Canterbury high country was the first large station to be completed in New Zealand, and during the 1920s, the State built a series of generating stations (Brooking 1996). Probably the earliest, isolated private hydroelectric plant was built in 1927 at Irishman Creek Station in the Mackenzie Country by runholder and inventor C.W.F. (Bill) Hamilton (Whelan 1988). (His inventions would eventually include developments in heavy earth-moving equipment and the 'Hamilton' jet boat.) The power plant, 17.5 kW and manufactured in Scotland, and 5-acre (c. 2-ha) dam, constructed with earth-moving equipment designed by Hamilton himself, were installed to power his workshop and homestead. In the 1980s, they were still in use (Whelan 1988).

6.2.5 Scientific development

Geographer Alan Grey noted that 'The problems of developing and maintaining a good sward led, after 1910, to a two-pronged attack: the development of better and more reliable strains and associations of grasses, and the improvement of soil fertility' (Grey 1994: 354–355).

When Sir Frank Heath, head of the British Department of Scientific and Industrial Research (DSIR), visited New Zealand in 1926, he was astonished by the interest shown by ordinary people in scientific work (Atkinson 1976). Third-generation pastoralists and farmers were aware that the fertility of the soil was becoming exhausted, that diseases had to be mastered, and that markets were becoming more and more competitive. He recommended that a DSIR be established in New Zealand, and the new department was established in August the same year (Atkinson 1976).

The *Journal of Agriculture* had been started by the Department of Agriculture in 1910 and proved very useful to pastoralists and farmers (Brooking 1996). Declining soil fertility spurred landholders to reconsider their management practices and to search for scientific remedies (Brooking 1996). After the DSIR was founded, scientists from there and the Department of Agriculture began to liaise systematically with the pastoralists and farmers (Brooking 1996). Lincoln School of Agriculture, which was established by landowners in 1880, was upgraded in 1896. Massey Agricultural College was founded in 1926 (McLintock 1966).

Organised research was just beginning to get off the ground as the country felt the full impact of the economic depression in 1930 (Atkinson 1976). Although the pastoralists and farmers had been hopeful that some of their worst problems could be solved by science, expansion was not possible as the depression deepened (Atkinson 1976).

6.2.6 Effects of the 1930s depression

During the depression of 1930–35, runholders on large high-country estates managed relatively well. Some had enough capital to purchase cheap stock and land and to make considerable improvements to their properties (Brooking 1996). By contrast, indebted small farmers on marginal areas could not survive (Brooking 1996). The extent of unemployment generally in New Zealand (12%–15%), and the poverty and malnutrition among the unemployed, the unskilled, the financially over-committed small farmers, women and most Maori helped a radical new Labour Government to sweep into power in 1935 (Brooking 1996).

6.2.7 Case studies

This section follows the fate of two vast high-country landholdings that were discussed earlier in the report. The first, situated in Nelson/Marlborough, became an environmental and financial disaster, and the second, which was in Otago, was subdivided into many smaller blocks.

Tarndale, Rainbow and Molesworth

In July 1911 Tarndale, including Rainbow Station, was transferred from William Acton-Adams to Duncan Rutherford of Leslie Hills Station (McCaskill 1970). The next month, Molesworth Station was transferred from Acton-Adams to Rutherford's wife, Eva. At the time, the two runs carried 42 000 sheep and 400 head of cattle (McCaskill 1970).

Unluckily for the Rutherfords, the 1912 winter was severe. Tarndale and Molesworth lost 18 000 sheep worth £9,000, and only 46% of the lambs survived (McCaskill 1970). The Rutherfords asked the Nelson and Marlborough Land Boards to extend their leases, to allow them to risk stocking up again, but were turned down (McCaskill 1970). Duncan Rutherford explained that on the Tarndale-Rainbow runs:

> 'I have had four good warm huts erected for winter work; paid two-thirds of the cost of the stock bridge over the Acheron River (which is the first bridge between Marlborough and Canterbury), also a stock bridge over the Clarence River near Lake Tennyson, and paddocks, and have practically broken the back of the rabbits which have been giving so much trouble of recent years. I am also sending up two tons of grass-seed for surface sowing on the Molesworth freehold.'
>
> (Rutherford 1913, cited in McCaskill 1970: 108)

In 1915, Eva Rutherford wrote (probably at the behest of her husband) seeking security of tenure; her lease was due to expire in 1918 (McCaskill 1970). She promised that if she was successful, it would be worth her while to open up the country with bridle tracks, make more subdivisions with rabbit netting and plant trees. She explained that:

> 'A large portion of the country has been ruined by overstocking, burning and rabbits, and is now quite denuded of herbage of any kind. Eighteen months ago I tried surface sowing (cocksfoot, cowgrass and white clover) with very little results. To do any good, it will be necessary to experiment with various grasses to see which will grow on the loose shingle country. The Government are experimenting in the Mackenzie Country in this direction.'
>
> (Mrs Rutherford 1915, cited in McCaskill 1970: 110)

Meanwhile, the Tarndale lease was due to expire in 1917. Both leases were extended until 1938 (McCaskill 1970).

Duncan Rutherford died in 1917, and in 1918 Molesworth was sold to William Nicholls of Belfast, and Tarndale was sold to his son, William Aubrey Nicholls (McCaskill 1970). They had heavy losses of sheep in the snows of 1918, and deer became so numerous between the Rainbow Reserve and Tophouse that the manager was unable to graze stock in that area (McCaskill 1970). William Nicholls died in 1920, and that year R.W. Lochhead, a Canterbury farmer and a director of the New Zealand Farmers' Cooperative Association, purchased the Tarndale-Rainbow lease and his son, John, bought the Molesworth lease (McCaskill 1970). McCaskill (1970: 113–114) wrote: 'It would appear that a syndicate of directors and senior officials of the Farmers' Co-op. Association were the prime movers in the purchase and that the Lochheads were really

"dummies" whose initial contributions towards the purchase were soon lost'. Management policy was under the control of the Association, and the management hardly ever visited the runs. Within a few months, John had a serious accident, and his father offered both runs to the Government for soldier settlement (McCaskill 1970). After inspections by members of both the Nelson and the Marlborough Land Boards and the Commissioners of Crown Lands, the Government was advised that the area was 'quite unsuitable for soldier settlement owing to the altitude and heavy losses of sheep in winter' (McCaskill 1970: 114). Hence, the Farmers' Cooperative Association kept control until 1938 (McCaskill 1970).

Thomas Leighton, who had worked on stations on the Awatere Valley, was appointed manager (McCaskill 1970). He had the task of trying to suppress rabbits, rebuild a flock, repair fences and maintain buildings during the 1920s' recession and 1930s' depression. Lochhead had become bankrupt, and the Association was losing money so quickly that in September 1922 it had to take a mortgage of £10,000 from the Bank of New Zealand over the stock (McCaskill 1970). The Nicholls Estate held a mortgage of £6,000 over the freehold areas. In 1932, a Commissioner of Crown Lands wrote that outsiders generally thought the project was grossly mismanaged. While Leighton, the working manager, was considered capable, he was not given a free hand by the Association. The commissioner had been informed that although Leighton wanted to increase the ewe flock and build up the flock from sheep bred on the run, the Association directors would not agree (McCaskill 1970).

Deterioration was visible in the soil, the native pastures and the flock. In 1926, the Farmers' Cooperative Association offered the combined property for sale. No offer was accepted. One offer, made by a North Canterbury farmer, was of £46,000 for 276 624 acres (c. 112 033 ha), leasehold and freehold, and 17 000 sheep, 1418 cattle and 60 horses (McCaskill 1970). In 1929, following huge losses of sheep in heavy snow, the Association purchased up to 13 500 sheep from the Mackenzie Country to replace them (McCaskill 1970). Within 2 years, all these sheep were dead. From then on, the flock was kept at 20 000 or more (McCaskill 1970). Little was spent on rabbit control. In 1931, the Land Development Board complained about the heavy infestation (McCaskill 1970). The adjoining Muller-Langridge Run was also eaten out by rabbits (McCaskill 1970). In April 1932, the Commissioner of Crown Lands in Blenheim reported that the best country in the valleys and hillsides was swarming with rabbits (McCaskill 1970). About 30 000 rabbit skins had been taken from Rainbow, Tarndale and Molesworth in each of the preceding 2 years (McCaskill 1970). He wrote that:

> '... if three times that number were taken off Molesworth Station, there would be no appreciable difference in the rabbit population. The pest was out of control. Only two poisoners were operating in the country about Lake McRae. Another man and two boys were poisoning in the Severn Valley, one trapper was in the Alma Valley and another was trapping about the homestead. Clearly, the small team of five men and two boys could not hope to deal properly with the pest.'
>
> (McCaskill 1970)

In November, inspectors from the Departments of Lands and Agriculture toured the combined runs. They saw that virtually the entire sunny faces were overrun by rabbits and that the fine pastoral country was so denuded of herbage that soil was slipping into the rivers (McCaskill 1970). By January 1937, the Association decided to abandon the properties (McCaskill 1970). The losses had been so great that the directors were unable to find further advances to work them (McCaskill 1970). Stock were sold.

A party of Marlborough runholders and businessmen visited Molesworth in May 1937. The road was a winding track over constantly moving shingle beds (McCaskill 1970). On their return, the powerful motor lorry that was carrying them became marooned in the middle of the Awatere River. A motorcar and driver attempted to rescue them, but the vehicle was damaged by a boulder. Next, one of the station drays arrived to assist. Unfortunately, it tipped the travellers into the icy river. The men were forced to walk to Blenheim in the dark (McCaskill 1970). One member of the party, G.H. Andrew of Birch Hill Station, blamed the Lands Department for the parlous state of the road because it had refused to agree to improvements between Molesworth and the Acheron Accommodation House: 'All the Lands Department had been doing for years was to take money off the place in the form of rent and put nothing back into it, and many other high-country sheep runs had been treated in a similar manner', he complained (Andrew 1937, cited in McCaskill 1970: 127).

With regard to the shingle slides, Leighton, the manager, argued:

> 'Rabbits are not to blame. In the early years the practice of runholders was to burn off the tussock in the spring. Being spring, the only places which could take the fire were the sunny faces where a fire would burn a foot underground right to the roots of the giant tussocks, leaving the soil exposed to the weather. Periodically, there were terrific cloud-bursts which scooped out whole hillsides at a time. Rabbits did a lot of damage but they didn't range as high as where the shingle first started to slide.'
>
> (Leighton 1937, cited in McCaskill 1970: 128)

He believed that the only hope for the future was to stock Molesworth with cattle. In March 1938, the Marlborough and Nelson Land Boards recommended that the Government accept the Lochheads' surrender of their licences (McCaskill 1970). That year, the Department of Lands took over the huge block of country comprising the Molesworth and Tarndale-Rainbow Runs. The runs were characterised by dispersed stock, dilapidated fences and buildings, rampant rabbits, severely degraded grasslands and extreme soil erosion over vast areas (McCaskill 1970).

Benmore

When Benmore Station was purchased by Robert Campbell and William Low in 1863, they paid £36,000 for 203 560 acres (c. 82 442 ha), about 15 000 sheep, 19 horses, four teams of bullocks and 30 cattle (Pinney 1981). In 1892, James Sutherland from Waitati became head

shepherd and he soon had to deal with a succession of crises. For example, during the 1895 snow storm, 41 729 sheep were lost, leaving 61 344 (Pinney 1981). 1903 was an extremely bad winter, with 2 days of continuous rain followed by 30 inches (c. 76 cm) of snowfall (Pinney 1981). Sheep were soaked through before being snowed in and frozen to death. In the spring of 1904, a storm left dead lambs all over the hillsides (Pinney 1981). Outbreaks of blood poisoning occurred in 1903 and 1909 (Pinney 1981); sheep became lame and many died.

In terms of stocking, by 1898 there were 94 683 sheep on Benmore, 15 500 of which were crossbreds (Pinney 1981). These were the progeny of merinos crossed with long-wooled breeds that were bigger with longer and coarser fleeces than the merinos. With the developing trade for meat, they had become more valuable than the merinos. By 1916, there were 68 000 crossbreds and 32 000 merinos, including their crossbred lambs (Pinney 1981). The average wool weight of each sheep had risen, largely because of the replacement of merinos by crossbreds (Pinney 1981). From 1902, the station also ran Hereford-Shorthorn cattle: 107–173 calves; 50–75 steers; and 20–30 heifers (Pinney 1981). Useful horses were bred—those that could endure harsh conditions and ford rivers (Pinney 1981).

When Robert Campbell and Sons (the London company that had been the owners since 1881) criticised the cost of rabbiting, Sutherland responded that they must be kept down regardless of expense (Pinney 1981). He used three or four gangs of poisoners each autumn and the shepherds usually formed an extra poison gang between midwinter and lambing; the station packmen and waggoners supplied the camps and brought in skins. Up to 16 men followed up the work of the poisoners by shooting, ferreting and digging (Pinney 1981). By 1913, rabbits were hardly to be seen (Pinney 1981).

At Benmore, the only mechanical aid was water power, which was used for shearing, sawing and cutting chaff (Pinney 1981). At this station, men were more valuable than machines. The appearance of traction engines in 1894 had been brief (Pinney 1981): they frequently became bogged down, and their owners were indebted. In 1913, the traction engine owner went bankrupt and the contract reverted to horse waggoners, the Harris brothers of Hakataramea (Pinney 1981). The telephone reached Omarama Station in 1903–04 and Benmore in 1913 (Pinney 1981).

Benmore Station was subdivided in 1916, during the First World War (Pinney 1981). The final shearing was complicated by the absence of Australian shearers and demands for higher wages by New Zealand men not at war (Pinney 1981). In February, 86 000 sheep and 21 000 lambs were assembled, which were sold in March (Pinney 1981). Over 600 people and 150 motorcars arrived at the sale. Many of the sheep were bought by the new tenants of the divisions of Benmore. In April, there was a second sale, and a muster of stragglers brought in 630 more sheep (Pinney 1981). Sutherland bought the homestead block.

The affairs of Benmore were wound up on 30 April 1916 (Pinney 1981). The company had already lost Otekaike and Burwood, and Galloway was

soon to go as well (Pinney 1981). The stations that would evolve out of Benmore and the Otago part of Lake Ohau Station by 1976 were: Benmore, Peak Valley, Ben Omar, Totara Peak, Glencairn, Glenbrook, Buscot, Willowburn, Riverside, Gleneyrie, Ohau Downs, Shelton Downs, Tarnbrae, Bendhu, Quailburn Downs, Claycliffs, Ahuriri Downs, Birdwood, Ribbonwood, Quailburn, Avoca, Lake Ohau and Huxley Gorge (Pinney 1981) (Fig. 21).

6.2.8 Tourism

High-country recreation began in the 1880s (with the construction of the Hermitage Hotel) and gradually expanded through to the years of the Second World War (Historic Resources Directorate 1997). Visitors from New Zealand and overseas began travelling to remote areas to sightsee or to go tramping, mountaineering, skiing or hunting. The Government became involved in the formation of national parks, private businesses sprang up specialising in backcountry recreation and clubs were established (Historic Resources Directorate 1997). Specialist facilities such as hotels, huts, tracks and bridges were built to foster tourism in the high country.

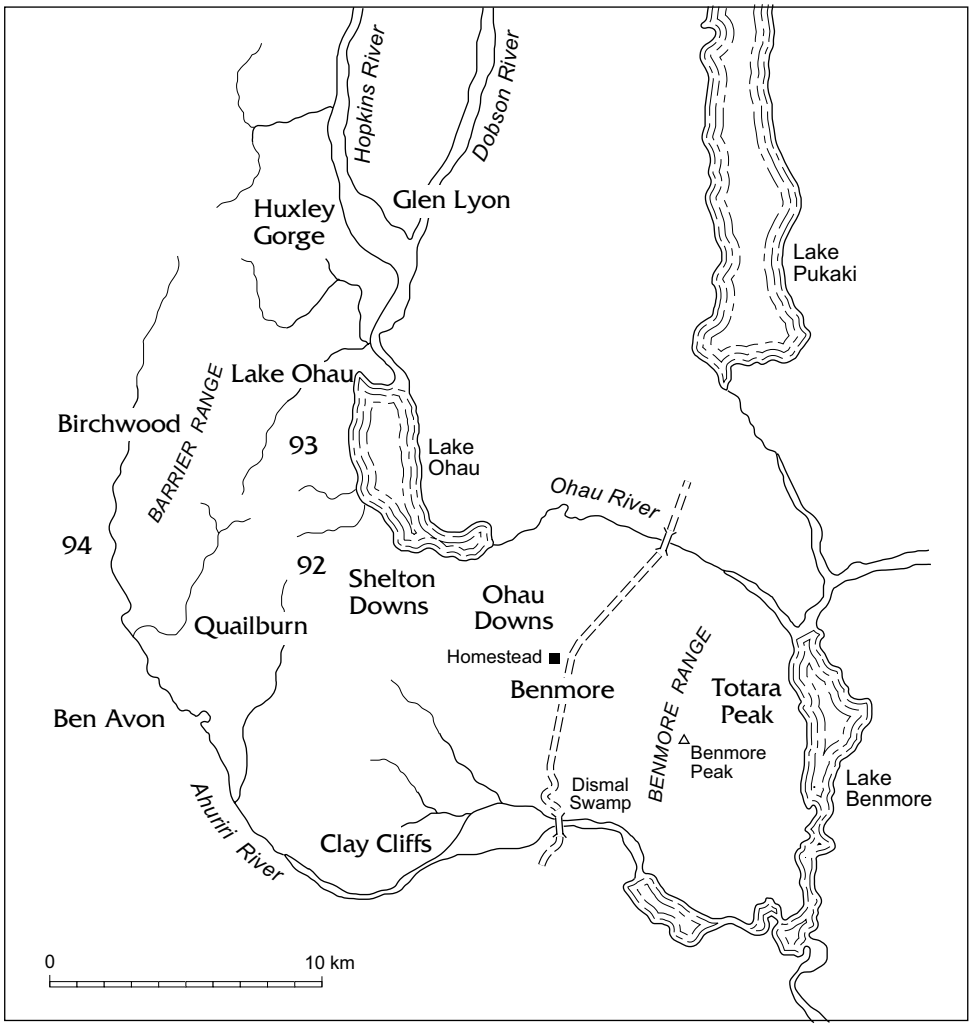

Figure 21. Some subdivisions of Benmore Station, after Pinney (1981).

In 1895, the Government bought out the Hermitage Hotel and operated it until 1922 (Grey 1994). In 1910, skiing was introduced to glacier excursions (Grey 1994). Exotic game animals, such as chamois and Himalayan tahr, were introduced for hunting (Grey 1994). In 1922, the Government rented the hotel to the Mount Cook Motor Company, and in 1935 an airstrip was built (Grey 1994).

Milford Track in Fiordland was built in the early 1890s (Historic Resources Directorate 1997). Benches, bridges and huts were constructed and the Government operated boat services to provide access (Historic Resources Directorate 1997). Glade House was built there in 1896 (Historic Resources Directorate 1997). At Mount Cook, Ball Hut was built c. 1890, and Malte Brun Hut, at a higher altitude, in 1898 (Historic Resources Directorate 1997). The only remains of the original Ball Hut, which was swept away by an avalanche in 1925, is a floor slab on the hillside slightly above the present-day shelter (Historic Resources Directorate 1997).

6.3 LAND TENURE

Possibly the first major debate over water rights in New Zealand took place between 1900 and 1919 (Roche 1994). This was directly relevant to the Central Otago high country. Geographer Michael Roche wrote that:

> 'More capital-intensive gold-mining, using dredges, was pouring sieved river gravels back into the stream bed, disrupting channel flows and discolouring water for downstream farm users. On one side of the debate were the miners, their rights backed up by a raft of state legislation which facilitated resource exploitation; on the other side were the farmers, whose common law riparian rights the courts tended to uphold.' (Roche 1994: 17)

The economic decline of the mining industry was matched by a decline in its political and legal power.

The River Commission of 1919–20 investigated the issue of damage caused by mining, which still affected the Taieri, Maerewhenua and Clutha Rivers (Roche 1994). The value of gold extracted was now far below the costs incurred through flooding, and the mining industry bore none of the costs. Until the Mining Act 1926 was passed, water rights legislation was piecemeal and drawn up in response to problems as they occurred (Roche 1994).

William Massey, who was the Reform Prime Minister from 1912 until his death in 1925, was elected on a platform of granting the freehold option to Crown tenants, many of whom were on South Island high-country land (Condliffe 1959). He immediately picked up the portfolio of Lands and soon carried the Land Laws Amendment Act 1912, which made lease-in-perpetuity lands purchasable on terms favourable to the tenants (Condliffe 1959).

Almost every year through to 1935, the principle of the freehold was gradually extended by amending the Land Act (Condliffe 1959). With

some restrictions, the National Endowment Lands on the eastern side of the South Island high country were also opened to purchase by the tenants over that period (Condliffe 1959). Simultaneously, the Government attempted to liberalise the conditions of the pastoral leasehold tenures that affected much of the high country.

Predatory farming (encouraged by short leases) and insufficient compensation for improvements attracted heavy political and public criticism (Condliffe 1959). Both production and value of pastoral runs, most of which were in the high country, had declined. Almost 10 million acres (4.05 million ha) of land were currently returning on average only 2.32 pence per acre (Condliffe 1959). Leasehold lands were overstocked, rabbits ran rampant, pastures were in poor condition, burning off was done at the wrong times of the year, and erosion and denuding of the hillsides occurred (Condliffe 1959). Otago had the largest area of high-country pastoral leasehold land, and population growth there was slow (Condliffe 1959).

The Royal Commission of 1920, which investigated the problem of deteriorating pasture, made a number of recommendations with regard to the Land Laws Amendment Act 1907 and subsequent amending acts, advising that they be reconstructed as they had indirectly caused the deterioration of high-country pastures 'to the detriment of both the State and the lessees' (Sadd et al. 1920: 9). According to Sadd et al. (1920), the Commission strongly suggested that:

- The 21-year tenure provided by the 1907 Act was too short to make improvements and develop pasture, and should be increased to 35 years with the right of renewal
- After 7 years had passed, the lessee might have the option of acquiring the fee simple (land with unrestricted rights of disposal)
- National Endowment Lands should not be converted to freehold land unless an equivalent piece of land was substituted
- All leases of pastoral land should be offered for selection by ballot in order to put the residential obligations of pastoral runs on the same basis as those for small grazing runs
- Suitable properties should be subdivided
- These conditions should apply to all renewals or licenses, and all the Land Acts should be consolidated

With regard to occupation, cultivation, stocking and improvement of Crown pastoral lands, the commissioners advised that none should be held by any public or private registered companies or absentees: 'Personal residence where possible … is absolutely essential to true settlement, and also ensures better management and greater productivity of the pastoral holdings' (Sadd et al. 1920: 10). They also recommended that the land should be 'spelled' when necessary and no more than three crops should be taken from the same land in succession. At the time, very little was known about the actual regrassing or improving of depleted and deteriorated lands, and the commissioners urged that experiments be conducted in these areas (Sadd et al. 1920). At that time, the Department

of Agriculture was studying grasslands on a small scale to understand their destruction and restoration. The commisioners thought that this work should be expanded (Sadd et al. 1920).

The commissioners gave specific advice on getting rid of rabbits and surface sowing. For disposing of rabbits, they recommended: rabbit netting provided at cost price by the Government; poisoning; the use of dogs, ferrets and guns; digging out; the protection by law of all natural enemies; the breeding and liberation of ferrets and cats; and fumigation (Sadd et al. 1920). Few data were available concerning surface sowing on mountains above 500–700 m in altitude. Although the Department of Agriculture was conducting experiments to find out if it was possible to regrass extremely denuded country at 300–700 m, it was too early to offer suggestions (Sadd et al. 1920). The commissioners felt that far more could done with regard to growing winter crops on high-country sheep stations, and they suggested that cocksfoot, red clover and probably lucerne should be grown (Sadd et al. 1920). Tussock burning should continue in order to provide a seed bed (in the ashes)—but only in the spring. They stressed that 'in supporting burning, it must be understood that we are altogether opposed to *indiscriminate burning*. Burning, indeed, requires carrying out with the utmost discretion' (Sadd et al. 1920: 20). They observed that spelling and exclusion experiments were being conducted in the depleted lowlands of Central Otago, and within special enclosures 'in the plantations at Galloway and Omarama, and in the Agricultural Department's Earnscleugh experimental area near Clyde, there has been truly remarkable regeneration' (Sadd et al. 1920: 19). In advocating the use of introduced predators and even limited burning, they revealed themselves to be men of their times, with their focus on pragmatic farming considerations rather than environmental issues.

Geographer Michael Roche commented that:

> 'Like many commissions of inquiry, the investigation of the Southern pastoral Lands Commission had only limited impact. However, it reflected prevailing attitudes, especially the denial that fire was really a problem. Indiscriminate burning was rejected, but on balance the commissioners accepted farmers' arguments that burning improved and sustained the tussock grasslands, despite the views of Cockayne and others. The affirmation of farming practice reflects the vested position and political influence of pastoralists at this time; it also conceals the financial imperatives they faced for maintaining production, in that some mortgage agreements specified the retention of high stocking levels as a condition of the loan.' (Roche 1994: 27)

Based on this report, legislation was introduced in 1921 and 1922, extending the right of freehold purchase to all South Island high country held under short-term leases, but ironically little advantage was taken of this legislation (Condliffe 1959). Economic circumstances had changed.

The Land Act 1924 introduced 35-year renewable terms for pastoral leases, extending the 1913 provisions for 21-year renewable terms (Broad 1994). David McLeod, runholder at Grasmere and Cora Lynn Stations

on the upper Waimakiriri River in northern Canterbury, commented on the Land Act 1924:

> 'The result of the commission's report was apparent in the Land Act of 1924 which embodied a number of recommendations on tenures and administration. But except for an intensification of the runholders' own attack on the rabbit problem (aided by fairly high prices for rabbit skins and the wide use of strychnine poisoning), and the generally accepted restriction of burning to a period in the spring, little change came over the management of the stations. It was still a basic tenet of the high-country management that tussock should be burnt every five years and that the more sheep that could be crowded into the high basins in summer the better for the run as a whole. The only touchstone for judging land use was the condition of the sheep in the autumn.' (McLeod 1980: 17)

Under the deferred-payment scheme (abolished in 1892), 1 028 023 acres (c. 416 349 ha) had been purchased, and just 311 763 acres (c. 126 264 ha) were converted into freehold lands after the system was reintroduced in 1912 (Broad 1994). The conversion of perpetual leases into freehold tenure happened almost entirely before 1912 (Broad 1994).

The reasons for the small overall effects of this policy reversal were:

- The leasehold versus freehold arguments were over the remnants (often in the high country) rather than the main areas of land in New Zealand.
- During the recession of the 1920s, the system of taxation was advantageous to Crown tenants. From 1923, Crown lessees of extensive high-country runs did not have to pay income tax. Consequently, between 1924 and 1926, while 193 785 acres (c. 78 483 ha) of freehold land and 181 502 acres (c. 73 508 ha) of private leasehold land went out of cultivation, the area of Crown leasehold land increased slightly (Condliffe 1959).
- When runs were auctioned, most runholders who wanted to managed to resecure their leases. Therefore, continuity of ownership was stronger than the lease might imply, and leaseholders faced little serious threat of being outbid (Broad 1994: 34).

6.3.1 Land subdivision

Soldier settlement

Land was purchased by the Government for discharged soldiers under the Discharged Soldier Settlement Act 1915 and its amendments (Condliffe 1959). Condliffe argued that this piece of legislation 'was more important as an agency of closer settlement in the post-war period than was the older purchase policy under the Lands for Settlements Act', although it was very costly because land was bought at the peak of land values in the post-war boom (Condliffe 1959: 264). He also wrote that it was the 'most conspicuous example of this form of government encouragement to speculation in the period 1890–1935 ... In effect the

Government turned loose in the real estate market 22,792 new purchasers armed with £23,570,491 of borrowed money' (Condliffe 1959: 276).

Land speculation that had begun with the return of prosperity in the mid-1890s had been spurred further by the decline of leasehold tenure. During the First World War, speculation became a form of gambling (Brooking 1996). The last attempt at closer settlement in the South Island high country took place in the Mackenzie Basin, which has some very dry areas. Between 1910 and 1920, several ambitious subdivisions were established, including those for soldier settlements (Broad 1994). The original 24 runs swelled to 45, but eventually, through amalgamation and partition, the Mackenzie Basin would revert to containing close to the original number of runs (Broad 1994).

The property market

Between 1890 and 1935, there was a strong trend among freeholders towards subdivision and closer settlement (Condliffe 1959). In times of escalating prices, speculation in land became frenzied—few farmers or runholders could resist the lure of rising prices. Condliffe wrote: 'In the Dominion it was the trafficking in rural land which was the outstanding characteristic of rural organisation on the freehold tenure' (Condliffe 1959: 275). During the time of rising prices before, throughout and immediately following the First World War, speculation was more pronounced than after 1921, when land values began to fall:

> 'The inevitable result was that in a time of violent speculation, such as followed the First World War, there was a clear tendency for the creditor class to take an increasing share of the returns from farming. The freeholder, under such circumstances, exchanged the landlord for the mortgagee ... Only those who had viewed farming as a permanent productive business and the rise and fall of land values as windfall gains and losses were on a sound economic basis.'
>
> (Condliffe 1959: 277–278)

6.3.2 Kai Tahu

The First World War of 1914–18 stopped any further consideration of the Kai Tahu Claim. In 1918, Judge W.E. Rawson of the Native Land Court completed a report announcing that, in order to qualify for a grant of land under the South Island Landless Natives Act 1906, claimants had to be landless descendants of those Maori who had ceded their land to the Crown, and to have been born before 31 August 1896 (Evison 1993: 482). More than 100 Kai Tahu proved they were eligible and applied for land, but did not receive any because all available and suitable blocks were used for soldier settlement. Instead, claimants were paid an average of 13 shillings and threepence per acre (Evison 1993). Kai Tahu historian Harry Evison wrote:

> 'The Government thus revealed the true market value of the 1906 South Island Landless Natives Act grants to Ngai Tahu. It was tacitly acknowledged that after more than thirty years of parliamentary campaigning for the Ngai Tahu Claim, and an official acknowledgement

that a substantial grant of land was justified, all that the average landless adult Ngai Tahu had got for his claim was £33/2s/6d or its equivalent in wasteland—enough perhaps to buy five or six acres of average farmland.' (Evison 1993: 482)

In 1921, Kemp's Purchase was again investigated by a Royal Commission. The Commission's report criticised the inadequacy of Mantell's reserves and the 1868 proceedings of Chief Judge Fenton, and declared that the South Island Landless Natives Act had been no solution to the Kai Tahu claim (Evison 1993). Since no land was available, not even in the high country, it recommended a payment of £354,000 as compensation for the unfulfilled promises in Kemp's Deed, based on the price per acre that had been paid for the Otago Purchase in 1844, as well as 72 years' interest at 5% (Evison 1993).

However, by this time few Pakeha New Zealanders took Maori claims seriously (Evison 1993). The Kai Tahu claim made no progress for 20 years after the Royal Commission's Report of 1921 (Evison 1993).

6.4 SUMMARY

6.4.1 General historical features

- Depredation of high-country tussock land by rabbits
- Invasion of high-country tussock land by indigenous and exotic plants unpalatable to stock
- Spread of pests such as the grass grub
- Burning off of mountain tussock
- Erosion of mountain slopes and formation of shingle slips because of burning off, depredation by rabbits, over stocking, continuous grazing and short-term leases
- Desertification of driest high-country areas
- Declining sheep returns
- Development of crossbred flocks and relative decline in the merino
- Declining productivity from the 1920s
- Planting of orchards and plantations on depleted areas
- Construction of irrigation systems and use of old mining water races for irrigation
- Irrigation schemes made dairying possible in some areas
- Expansion of close settlement
- Establishment of soldier settlements after the First World War
- Setting up of experimental plots and plantations by the State and private enterprise to assist the farming industry
- Sowing of exotic grasses
- Initiation of hydroelectric power network
- Cultivation of crops such as oats, turnips and lucerne for animal feed and/or to replenish the soil

- Continuing expansion of road and rail grids, and metalling of some roads
- Increasing use of traction engines, water-powered mechanical devices, internal combustion engine and electricity
- Further subdivision of high-country estates
- Growing State involvement in high-country recreation, and construction of huts, hotels, tracks and bridges
- Declining importance of extractive industries

6.4.2 Key physical resources

- Traction engines
- Cars, lorries and tractors
- Water-powered shearing machines, chaff cutters and saws
- Hydroelectric plants
- Hydroelectric dams
- Experimental farms and plantations
- Subdivided estates
- High-country huts, hotels, tracks and bridges

7. 1935–1948: High-country management and the soil conservation movement

7.1 LANDSCAPE MODIFICATION

Problems caused by burning, overstocking and continuous grazing of sheep without improvement, rabbits, and insecurity of tenure persisted in the high country. In addition, there were concerns over damage to pastoral grasslands by introduced weeds and noxious animals, and the intrusion of wilding trees into the landscape (Dominy 2001). In the early 1940s, historical geographer K.B. Cumberland observed that occupation of the South Island tussock high country had accelerated normal geological soil creep in regions of high frequency of freeze and thaw and induced landslides. In Central Otago, the diggers' hydraulic sluices had 'shifted the matted tussock cover and with it the surface soil to give birth to ever-extending gullies' and, in areas of lowest precipitation, tussock grassland had been reduced to semi-desert dominated by scabweed (Cumberland 1944: 159). He explained that:

> '... the tussock ranges were stocked with increasing intensity while their carrying capacity decreased. In addition, annual haphazard burning, rabbit infestation, and the spread of tussock insects have assisted in depleting, if not destroying, tussock species. Surface organic waste has often disappeared. Wind velocity is no longer effectively restricted at the soil surface. Moisture conservation by vegetation is reduced and the ground bared. Humus content of soil is diminished. On open plains and sunny hill faces this has led to accelerated wind and frost erosion and on higher mountain slopes to increased down-hill creep of "shingle slips" and mantles of wasting *Steinfelder*.'
>
> (Cumberland 1944: 160)

Canterbury runholder David McLeod, with C.L. Orbell, bought the Grasmere and Cora Lynn Stations on the upper Waimakariri River in 1930. He wrote that when he took over Grasmere in May 1930, he:

> '... had no other task than to perpetuate the traditional system of management, making use of every available square yard, however rugged or inaccessible, and of every plant that sheep would eat, no matter what its value might be to the environment as a whole. In this endeavour I spent the first ten years, struggling against the economic disasters of the early thirties and slowly coming to realise the part that depletion and nutrition played in that struggle.
>
> 'The following thirty years passed in a slow readjustment to the realities of the situation not only in the case of my own treasured home but in the wider sphere of the high country as a whole, where our own situation was duplicated all down the Southern Alps from Marlborough to Southland. During this time our knowledge slowly increased, not

only through studies of the soil, plant and animal relationships of the present and future but through searching back through the past for the history of our country.' (McLeod 1980: 17–18)

7.1.1 Rabbits

In Kaikoura at the time of the First World War, runholders had already been losing the battle against rabbits in the back country, particularly on Kekerengu Station (Sherrard 1966). The situation worsened with the shortage of labour and the abandonment of Bluff Station to the scourge. In 1920, a full-scale eradication programme was resumed and, although on Clarence Reserve gangs were destroying 100 000 rabbits each year, they could not wipe them out (Sherrard 1966). Annual rabbit skin returns exceeded those from wool (Sherrard 1966). Simultaneously, across the river, W.S. Bennett, A.J. Murray and P.J. Halligan attempted to recover Bluff Station (Sherrard 1966). Rabbits had turned the land into a desert, except for matagouri bushes, and even these had been stripped of their bark. Nine men rabbited, fenced and sowed seed, and pack teams carted food, fencing material and tons of grass seed up the 50-mile (c. 80.5-km) track (Sherrard 1966). The seed was mixed on site and sown by hand, and between 1921 and 1930, 8000 acres (3240 ha) were regrassed. Unfortunately, just as rabbit numbers began to decline, the economic depression of the 1930s and the Second World War (1939–45) forced retrenchment (Sherrard 1966).

At Grasmere and Cora Lynn during the war, McLeod also struggled:

> 'With most able-bodied countrymen away at the war the labour-intensive job of rabbiting became almost impossible and the catchment boards were well aware that they could never cure depletion and erosion as long as large areas of the country were overrun with this insidious pest. It was not until the Killer Rabbit Boards were formed and the trade in skin and carcase abolished that any progress was made and that was against the bitter opposition of a lot of people—runholders among them—who had had a very satisfactory income from the vermin.' (McLeod 1980: 47)

The three 'killer boards' that speeded rabbit destruction were: the Marlborough East Coast Rabbit District (1926); the Kekerengu Board (1946); and the Conway Rabbit Board (1949). The Conway Board especially achieved dramatic results by poisoning, fumigating, trapping, and the use of dogs and guns. In the first 2.5 years, 51 469 rabbits were killed above ground and probably three times that number were fumigated (Sherrard 1966).

The rabbit population was finally reduced to manageable numbers with the use of the aeroplane and 1080 poison after the war (McLeod 1980). In the dry areas of the Mackenzie Country and Central Otago, this combination was the most effective means of restoring the land (McLeod 1980). By 1956, the prohibition of the sale and export of rabbit skins was to put another nail in the rabbit coffin (McCaskill 1973).

7.1.2 Other pests

Wild cattle, deer, pigs, goats and Canadian geese also caused problems on the South Island high-country stations (McCaskill 1973). In the late 1920s, botanist Leonard Cockayne pointed out that, whereas deer and forests in other parts of the world had been closely associated for a long time, in New Zealand the forests had developed in the absence of grazing and browsing mammals. Deer were a new and destructive pest to New Zealand, and beech forests in the high country were in danger of being turned into fields of debris and barren ground. As a consequence, water would cascade down the bare slopes after each rainstorm, taking with it masses of stone, gravel and clay to smother the fertile, arable lands below and causing flooding in the rivers. He asked whether the protection of deer and other pests should be allowed to cause such havoc (Cockayne 1926, 1928, cited in McCaskill 1973: 178).

By 1935, Lake Coleridge Station was 'infested' with wild cattle, and in spring the musterers Peter Newton and Jim Binnie were hired to 'clean them out':

> 'Our agreement was to get what we could out alive and shoot the rest. They were cattle that had been hounded about many times in abortive attempts to muster them in, and they were as wild as deer. Living as they did in bush-bound country up rough creeks, it was no easy task and as Jim and I had had no experience of real wild cattle, we had to learn by our mistakes as we went. The cattle of course were fifty per cent. bulls, some of them hoary and crusty old gentlemen who had to be given a fairly wide berth unless one was astride a pretty good sort of horse.' (Newton 1953: 97)

In November that year, Newton went over to Mount White Station. He described the wildlife in this 'way back' station:

> 'I had never seen deer in such numbers and the Esk Valley harboured hundreds of wild pigs. The headwaters of all the rivers were the haunts of wild cattle, and the Lochinvar lagoons were prolific breeding grounds for Canadian geese. And even the nimble little chamois were then working their way north over those tops.' (Newton 1953: 108)

Newton stayed at Mount White for 3 years and while he was there government deer cullers came for a season. Although the weather was bad, the cullers killed 3000 deer. One of them stayed on for a further year and killed another 1200 (Newton 1953).

Mona Anderson explained the problem posed by Canadian geese at Mount Algidus Station in the 1940s:

> 'At that time it was illegal to kill them, but we caught them in dozens. They bred on the station in hundreds and were an absolute pest. A forty-acre paddock of turnips would be stripped bare by them as if sheep had been feeding there for months. Besides eating the winter feed, they polluted the paddocks so that the stock did not care to feed where they had been.' (Anderson 1963: 79)

Soon it became legal to kill geese, and the Government sent in cullers to smash the eggs and shoot nesting birds (Anderson 1963).

7.1.3 Weather

Weather was the perpetual wild card in the high country. At St Helens, Marlborough, 11 000 sheep were lost during a disastrous snow storm that blew in from the northwest during the winter of 1939, representing a 27% loss (McCaskill 1970). The Canterbury high country and foothills were blanketed with snow. In 1945, another snowstorm came from the southwest, covering the entire province of Canterbury (McLeod 1980). The years 1946, 1947 and 1948 were very poor for lambing. The main reason was bad weather in winter and spring, and in 1947 the Canterbury high country was subjected to a freak summer storm (McLeod 1980). At Grasmere, 1400 sheep were lost (McLeod 1980). Anthropologist Michèle Dominy contended that runholders often made the link between weather and market as:

> '... external forces against which control is futile and minor modification possible, and speculate that the high country copes better than most New Zealanders with economic crises because the are "geared for" uncontrollable factors that characterize high-country history, such as variable mountain-weather conditions, and boom-and-bust market cycles.' (Dominy 2001: 192)

7.1.4 Molesworth Station

The Crown took over Molesworth Station in 1938 because it had become an ecological disaster area and uneconomic to run (McCaskill 1970). The question of seeding the bare country was immediately considered, because of the success at Bluff Station. Experimental plots revealed that spring sowing was best, and that cocksfoot was the main grass, with ryegrass, white clover and red clover also present (McCaskill 1970). A programme of sowing was initiated in September 1940, with 3622 pounds (c. 1643 kg) of seed delivered to Molesworth. In 1940, the sheep were taken off, and the station was restocked with 788 head of Angus-Aberdeen and Hereford cattle (McCaskill 1970). (Lance McCaskill (1970) pointed out that this was a case of history repeating itself, as in the early days of Molesworth and Tarndale, only cattle were run.)

Wild deer, pigs and goats continued to denude Molesworth. In 1939, a private shooter killed at least 700 deer, and there were large numbers of goats in the Saxton and Severn Valleys and in the Yeo Creek Block (McCaskill 1970). Pigs were prolific in the Lake McRae-Elliott Block. The position became so serious that at the end of the war, when men were released from duty, the Department of Internal Affairs made a full onslaught on the problem using ex-soldiers as marksmen (McCaskill 1970). As every shooter got tallies of up to 1000, deer numbers receded, to the extent that by 1946 it was possible to stock the Saxton country with cattle (McCaskill 1970).

Between 1938 and 1949, Molesworth was amalgamated with Tarndale, Dillon and St Helens Stations, when their leases were also surrendered for similar reasons, to form one vast, remote station called 'Molesworth'

(Fig. 22). The land was rehabilitated, with difficulty, by controlling the rabbits, preventing burning, changing grazing patterns and oversowing grasslands (DOC 1999). Wilding trees and weeds such as brier and broom caused the greatest damage to the vegetation cover, and extreme weather conditions limited plant growth. The cattle were crossbred and coped well with the harsh conditions, and their population eventually increased to more than 10 000 as the vegetation improved (DOC 1999). By January 1946, the floors of most of the Molesworth valleys were covered by a variety of grasses, tussock was seeding all over the station and the native bluegrass had reappeared. Although vast areas consisted of shingle slides, depleted mountain sides and patches of scabweed, many shingle slips had been arrested by new growth, often sorrel and Yorkshire fog, and formerly bare faces had incipient cover (McCaskill 1970). The restoration of Molesworth is now cited as one of New Zealand's major soil conservation and farming successes (DOC 1999). Figures 23 and 24 show Molesworth Station as it is today. Figure 25 illustrates the environmental changes that have occurred on Molesworth as a consequence of burning and the taking of timber.

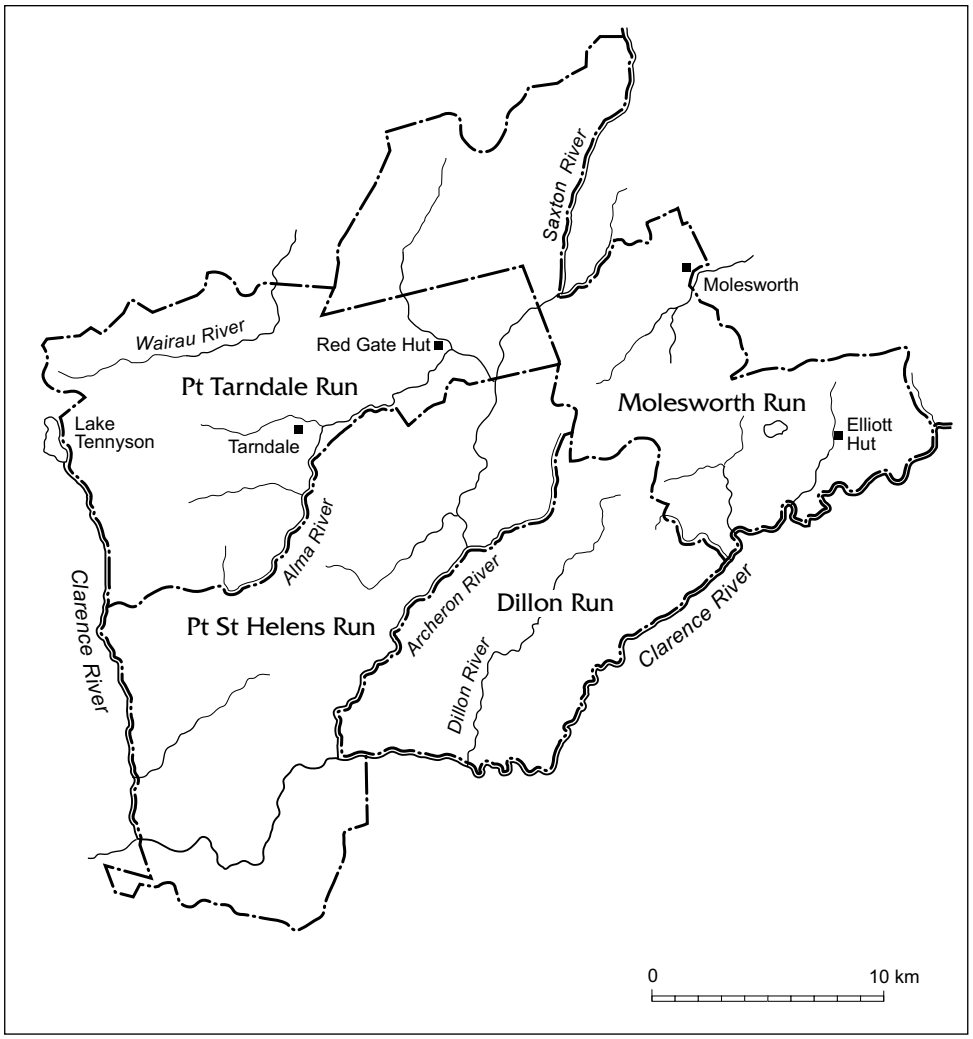

Figure 22. Map of Molesworth Station in 1949, after McCaskill (1970).

Figure 23. Aerial oblique of Molesworth Station: distant view looking southwest. *Photo courtesy of Kevin L. Jones, DOC.*

Figure 24. Aerial oblique of Molesworth Station: close view of station homestead and other buildings. *Photo courtesy of Kevin L. Jones, DOC.*

7.2 PHYSICAL REMAINS

Canterbury historian W.H. Scotter (1965) believed that the years 1935–48 were a separate period in the history of New Zealand because of the new developments in farming and industry and the election of the first Labour Government, and that these changes were intensified by the Second World War of 1939–45. In the high country, differences were made by the increasing use of jeeps, motor lorries and limespreaders. Topdressing began from vehicles in 1945 and from aeroplanes in 1949 (Scotter 1965).

Figure 25. Aerial oblique of Bush Gully on Molesworth Station. In this western valley, rainfall was sufficient to sustain a natural forest cover. The pattern of beech forest, which was partially destroyed by fire and the taking of timber, is still graphically marked on the landscape. *Photo courtesy of Kevin L. Jones, DOC.*

7.2.1 Population decline

Mechanisation and soil deterioration contributed to the loss of rural inhabitants, who were also attracted to expanding urban centres by job opportunities in the tertiary sector. For example, in Otago and Southland, the population declined by c. 10 000 between 1936 and 1945 (McLintock 1975). While the population in urban areas rose by 3500, that in rural areas actually fell by 13 500 (McLintock 1975). Historian A.H. McLintock contended that 'the decline in the rural population of Otago indicates the gradual but steady exhaustion and deterioration of the soil fertility' and that 'much of the wide expanse of Central Otago has suffered by reason of soil deterioration' (McLintock 1975: 752, 756).

7.2.2 Experimental plots

In 1920 and 1921, botanist Leonard Cockayne, a member of the 1920 Southern Pastoral Lands Commission, had fenced 12 rabbit-proof plots on depleted country at an altitude of 300–1000 m between Cromwell and Lowburn Ferry, and sown them with seed of various species of pasture plants (McCaskill 1973). A committee of runholders and an officer from the Department of Agriculture assessed the results and found that no improvement of the high-country soil was possible without subdivision, exclusion of rabbits and a regular system of spelling the land (McCaskill 1973). His lead was followed in 1938, when the Department of Agriculture began to supervise plant introduction trials on a 30-acre (12.15-ha) area at Pisa Flat (McCaskill 1973). Through to 1951, a total of 350 species and strains were tested for their suitability for revegetating semi-arid land (McCaskill 1973). In 1944, the Botany Division of the DSIR started a project of observation and experiment at Molesworth and Tarndale Blocks in Marlborough to discover which grasses and legumes were useful in renovating the grasslands and to propagate them (McCaskill 1973). Further experimental fenced enclosures were set up

by the North Canterbury Board in 1948. These showed that where the land was above c. 1000 m and/or the slope exceeded 30° and bare ground exceeded 40% of the area, vegetation was unable to cover the bare ground if sheep grazing continued (McCaskill 1973).

7.2.3 Sheep

The Government's acquisition of phosphate-rich Nauru Island in 1919 and the mixing of sulphuric acid with the phosphate at fertiliser plants dramatically boosted the supply of superphosphate to farmers (Brooking et al. 2002). However, South Island high-country runholders did not use superphosphate on any scale until aerial topdressing was introduced in 1949 (Brooking et al. 2002). Consequently, there was not a great increase in production between 1900 and 1950. While North Island sheep numbers increased from 12.9 million to 19 million between 1910 and 1950, those in the South Island rose from 11.3 million to 14.8 million (Brooking et al. 2002).

In spite of the general increase in the number of sheep, merino flocks declined. A government report stated that the substitution of heavier and less hardy sheep for merinos led to a fall in the number of sheep in the foothills of Canterbury (Scotter 1965). Half-breds declined too, but crossbred flocks stayed at around 3 000 000 (Scotter 1965). The main feature of the years 1935–45 was the swift rise in the number of Romneys (Table 1).

TABLE 1. NUMBER OF SHEEP IN CANTERBURY IN 1935 AND 1945. DATA TAKEN FROM SCOTTER (1965).

BREED	1935	1945
Romney	92 000	342 000
Merino	465 000	367 000
Corriedale	746 000	797 000
Half-bred	1 207 000	1 129 000
Crossbred	2 848 000	2 767 000

7.2.4 Wool

During the Second World War, the price of wool was controlled at what was, according to farmers, a low level, averaging 12 pence to 14 pence a pound (Scotter 1965). After the war, farmers returned to the auction system of wool selling (McLeod 1980). World prices rose quickly for all wools, and the demand for merino and fine crossbred wool after years of restraint drove their relative value to a considerable premium over coarser wools (McLeod 1980). The high country experienced its most prosperous period yet. Timaru doubled its wool exports from 6000 tons in 1938 to 12 000 tons in 1950 (Scotter 1965). Maintenance and development had been neglected for many years because of the war, and much of the profit was spent on buildings, fences, manures and seeds (McLeod 1980). Some runholders, like McLeod, built power plants (McLeod 1980). The boom lasted for several years, until the Korean War of 1950 escalated the demand further and prompted the Prime Minister at the time, Sid Holland, to freeze a third of farmers' wool receipts as a hedge against inflation (McLeod 1980). The price of wool remained fairly high throughout the 1950s (McLeod 1980).

Higher wool and stock prices, new techniques, and the research services provided by the Department of Agriculture and Lincoln College helped to improve the management of the high country (Scotter 1965).

7.2.5 Woolsheds

Dominy (2001) wrote that the woolshed encapsulates the history of the high-country sheep station, fusing farm and homesite. It was the communal site for social activities, such as dog trials, family reunions, dances and weddings. She suggested that:

> 'The cultural significance of the woolshed may also derive from the role it plays, like the yards and tailing yards, as a physical and conceptual intermediate space between uncultivated pastoral land and the homestead: as the ultimate container for the expansiveness of stock activity and human labor, it is the physical site for harvesting a product, the fleece, and for concentrating the labor force (farmers, family, shearers and classer); and it is the conceptual site for distilling the landscape and pastoral activities of the year into fleece.'
>
> (Dominy 2001: 189)

The function of the woolshed as the station nexus did not change, and during the post-war period of prosperity, many old woolsheds were improved and new ones built.

7.2.6 Mustering

Mustering also continued throughout this period with little change. Dominy studied the high-country tradition:

> 'The seasonal use of extensive back-country tussock grasslands with their low-carrying capacity most distinguishes high-country merino farming from hill- and down-country farming. In autumn—either April or May depending on a property's altitude and latitude—sheep are "mustered in," brought from remote summer grazing country into the station's front country. Autumn-muster narratives predominate in station and family histories, autobiographies, short stories, station and farm verse, and novels... Such accounts tell us how essential mustering is to the distinctiveness of high-country farming.'
>
> (Dominy 2001: 167)

Dominy noticed that Canterbury runholder Peter Ensor began his mustering narratives by describing the front faces of Double Hill, Glenrock and Glenariffe on the upper Rakaia River and also the back country, which encompassed two-thirds of the combined properties (Dominy 2001). He gave the altitudes of the main peaks and the two most significant saddles—Macintosh's at 1000 m, and Turtons at 1300 m. He and his two brothers mustered in together. Later, their sons and other relatives and neighbours did the same (Dominy 2001).

The traditional Double Hill autumn muster of the 1940s took six or seven men with a packman and four horses 6 days to complete. Ensor's narratives outlined familiar routes, which often followed streams or ridgelines, altitudes and distances, mustering hut locations, and the

long hard journey faced by the packman with his heavily laden horses (Dominy 2001). At Erewhon, before the advent of helicopters, the muster took 35 days. Much of the Double Hill country was to be closed up after the last big muster in 1968 (Dominy 2001).

Dominy concluded that:

> 'For Rakaia families, the autumn muster persists as a focal point of back-country pastoral activity. Because topography does not change much, the mustering beats remain constant over the years, as do the paths taken by sheep and men; such physical traces provide unexpected degrees of continuity with the past. Property and fencing subdivision may change the routes slightly, as may scrub growth or unstable scree slopes, but even these transformations depend on the contour of the land and predetermined beats and, most important, they must consider sheep movement or else the stock will smother against new fences.' (Dominy 2001: 168–169)

Distances covered were vast, and 'taking a beat' (or horizontal section) meant finding one's way across scree slopes, above or below sheer rock faces and gullies, along ridges, and down spurs (Dominy 2001). Beats could be up to 1.5 km wide and 16 km long. In assigning a beat, the runholder or head shepherd gauged a man's ability, the calibre and mix of his dogs, and the steepness and difficulty of the country. He tried to be fair in giving each a turn at top, middle and bottom beats (Dominy 2001). Mustering huts were still virtually the only dwellings to be found in the remote back country (Historic Resources Directorate 1997).

Mona Anderson described the four huts she sheltered in while mustering on Mount Algidus Station in the late 1930s: 'The four huts, More-rain, Mistake, Manuel's and Moa had all been very well built. All had thick concrete walls with corrugated iron on the outside and a lining of tin inside' (Anderson 1963: 46–47). Mistake had two rooms: a living room with a wide fireplace at one end and a bunkroom with eight bunks. The living room had kitchen utensils, a big table and two long forms, and an armchair that had probably been made with a pocket knife by a musterer on a wet day (Anderson 1963). Manuel's hut also had two rooms, and the others had one. Their colourful names referred to past events, characters and relics. Verses, ditties and anecdotes were scribbled on the walls (Anderson 1963). Further up the Wilberforce Gorge, dating from gold rush days, were the remains of Miners' and Dynamite Huts, a large blacksmith's shop, an accommodation house, and the beginnings of a road across Browning Pass that was littered with rusting metal tools (Anderson 1963).

In the early 20th century, gangs stayed longer on a station than they do today, in the early 21st century (Dominy 2001). They played cricket and golf, and held dances. A stronger sense of community and kinship was created (Dominy 2001). The high-country population rose while the men were mustering, as it did during shearing. Class distinctions between runholders and shepherds were bridged, but at the same time class lines were strengthened, as one man's son would apprentice to his father's old classmates (Dominy 2001).

7.2.7 Transport and communication

High-country runs carried on using packhorses despite the advent of motor vehicles, and some runs were still extremely isolated. For example, the musterer Peter Newton wrote that in the late 1930s, Mount White in northern Canterbury had the finest team of packhorses that he had ever seen, 'all light draughts and bred on the place' (Newton 1953: 113). He recalled the time that he and his mate 'Honey' Richards went to a dance:

> 'At Mt. White we were truly shut off from the rest of the world. Honey and I did once venture out to a dance, but it was a trip we would not care to make every day in the week. We left the homestead at 4 p.m., rode twenty miles to Cass in four inches of snow, left our hacks in the railway yards, and caught a goods train to Springfield thirty-five miles away. At 2 a.m. we boarded another goods train on the return journey to Cass, and arrived back at the homestead just in time for breakfast. In all, we travelled seventy miles by goods train and just on forty per pig skin—and thought it worth it.'
>
> (Newton 1953: 120)

In 1936, the inter-island air service began, rail cars started to run to schedule on the Midland line to Greymouth and the Bealey Bridge was opened. In 1937, the Lewis Pass road was opened, and in 1939 the Rakaia traffic bridge opened up that area. By the late 1930s, the number of private motorcars had increased, and a new trend of weekend and holiday motoring was evident. The earliest motor lorries began carrying loads from some of the most remote stations in the 1930s. Sheep were driven across narrow suspension bridges (Fig. 26).

Mona Anderson gave her first impression of 'the dreaded Wilberforce' River on her arrival at Mount Algidus Station as a young bride in the late 1930s:

> 'The waters of the Wilberforce were locked up for the winter in the heavy matrices of snow and ice that rested on the mountains. Months later I was to see it with the spring thaw on its back—brown, ugly and raging, a killer river that no man in his senses would cross. Now it was a gentle murmuring stream.' (Anderson 1963: 13)

During the thaw, the river became 'an impassable barrier' to the world outside (Anderson 1963: 39). Stores were taken in only once a year because of problems of access and transport, and sometimes they had to sit on the iron store across the river for days while the river subsided (Anderson 1963).

Betty Dick, who lived on Lilybank Station at the head of Lake Tekapo in Canterbury, wrote that all river crossings there were by horse or horse-drawn transport until 1949, when she and her husband, Allan, invested in a large four-wheel-drive ex-army vehicle (Dick 1964). Lorries fording the Macaulay River with sheep, stores, hay or wool all experienced difficulty when rapidly rising snow-fed rivers suddenly prevented access, sometimes within half an hour: 'The horse has been, and still is, a faithful friend for river crossings' (Dick 1964: 40). Years after the war, she continued to

Figure 26. View of a bridge crossing Lake Stream, Ashburton Lakes basin, off the upper Rakaia River, c. 1940–60. *Photo: J.D. Pascoe, courtesy of the Alexander Turnbull Library, Wellington, New Zealand (reference number 45006 ¼).*

rail about the 'bossy' Macaulay: 'At the river, in the river, over the river, through the river, always the river; by day or by night, in summer heat or winter snows, year in and year out, always the river' (Dick 1964: 52).

Even in the early 1960s, Betty Dick observed that high-country people 'still must ride into their remote high country stations as their grandparents rode one hundred years ago', and that:

> '... from the days of the first bullock waggons the roads have varied very little. It is well known that bullocks and horses would avoid soft swampy ground and quicksand patches by instinct—as is still the case with the horses we use in the river today—and the early bullock drivers always headed in long and reasonably straight lines for the mountains, sighting on the high peaks. So naturally with the advent of the traction engine the tracks would be firm and sure going.'
>
> (Dick 1964: 67)

Work on the Main Trunk Railway extension between Parnassus and Picton had ceased during the economic depression under the Coalition Government but recommenced in 1936 under Labour (Sherrard 1966). The railheads stretched north to the Hundalee in 1939 and Oaro in 1943, and south to the Clarence River in October 1942 (Sherrard 1966). The South Island Main Trunk line from Invercargill to Picton was opened at Kaikoura Station in December 1945 (Sherrard 1966).

When the Crown took over Molesworth Station in 1938, G.J. Powell, who began duties as caretaker and overseer of rabbiting for the Department of Agriculture, had to supervise contractors working across hundreds of thousands of acres on horseback (McCaskill 1970). In 1940, the Department of Lands and Survey took over control of rabbits, and in 1942 M.M. (Bill) Chisholm became manager (McCaskill 1970). He placed his rabbiters in strategic positions, and at first serviced them regularly by pack team or horse wagon (McCaskill 1970). The trip to Tarndale and back took 4 days. In 1944, the station was at last motorised. Chisholm obtained a 2.5-ton truck with two-wheel drive (McCaskill 1970). He was now able to take fresh supplies more frequently—once a week—to rabbiters and stock men. The truck broke down periodically and Chisolm learned to fix it. The provision of this truck also made possible the building of the first cattle yards at Tarndale. These were to become the most important centre for cattle operations (McCaskill 1970). Willow posts were cut from the trees at Molesworth and manuka rails were cut and carted from the headwaters of the Avon River (McCaskill 1970).

Realising that his most pressing problem was getting the poison to the rabbits, Chisolm soon began to investigate the possibility of light aircraft. McCaskill described the first aerial drop of poison:

> 'On 10 March 1944, in conjunction with the Marlborough Aero Club, he [Chisholm] organised the first aerial supply-drop of four tins of oats to Lake McCrae; this was followed in August by ten tons of carrots to the same area. The doors were taken off the Fox Moth and the oats, in forty pound bags tied loosely, were dropped one at a time from a height of forty feet. They were stacked by a man on the site and later packed to the camp. For the carrots, 200 parachutes ... were each loaded with thirty-five pounds and dropped from 400 feet into an area of about 100 yards across.' (McCaskill 1970: 159)

Later, swags of stores for the men were also dropped, saving the long haul by packhorse over the Robinson Saddle (McCaskill 1970).

The same year, in October, a Marlborough Aero Club aircraft was first used in connection with the muster of cattle (McCaskill 1970). When it was discovered that more than 400 cattle were missing after the preliminary round up, Chisolm asked for urgent permission to find them by air. The stock were located and swiftly brought in (McCaskill 1970).

The advantages of flight to high-country station workers became increasingly apparent during the Second World War. For example, when the head shepherd at Bluff Station fell ill with pneumonia, his father rode through the night to Kekerengu, from where an urgent plea for assistance was sent to the Royal New Zealand Air Force (RNZAF) station at Woodbourne (Sherrard 1966). A few hours later, an aeroplane landed at the Bluff carrying a doctor who saved the man's life (Sherrard 1966). Although the war interrupted the supply of phosphate and discouraged farmers from adopting more innovative methods, it encouraged the development of vastly improved aircraft (Brooking et al. 2002). Soil conservator Douglas Campbell worked with the RNZAF to adapt military planes for the role of dropping superphosphate from the air (Brooking et al. 2002).

In 1949, J.A. Chaffey, part-owner of Bluff Station, and L. Roberts, head shepherd, financed Aerial Work (Marlborough) Ltd (Sherrard 1966). A radio telephone was set up to enable Bluff homestead to keep in touch with Kekerengu, Blenheim and Molesworth Station, helping to speed the delivery of mail, freight and passengers (Sherrard 1966). Shearing expenses were reduced when a 600-m^2 pre-fabricated woolshed was flown in, saving a 9-day droving expedition to Kekerengu (Sherrard 1966). At Queenstown in 1948, F.J. (Popeye) Lucas, Chief Pilot of Southern Scenic Airtrips, carried out experimental sowing of grass seed at Moor Farm in the Clutha Valley, and at New Year in 1949, sowed 5000 acres (2025 ha) of the Winterslow Run at Methven, Canterbury, with 10 pounds per acre of cocksfoot and white clover (McCaskill 1973). His work would prove to be of vital significance to the future of soil conservation (McCaskill 1973). The development of an airstrip at Lilybank Station and the use of small aircraft would eventually enable Betty Dick to triumph over the Macaulay River (Dick 1964).

7.2.8 Effects of the Second World War

During the 1939–45 war, there was little labour available for management of high-country stations. Young, fit, single men who were relied on for mustering were the first to go into the army (McLeod 1980). For example, at Grasmere in Canterbury, David McLeod and his 'first class' musterer, Peter Newton, alone or with one other man mustered blocks that normally required five men (McLeod 1980):

> 'It took time and much walking and the skilful use of vantage points from which the scattered mobs of sheep could be spotted. Many a long run for the weary dogs was saved by the "Nelson huntaway"—a big rock prised out of a hillside and sent bounding and crashing down to start sheep moving 300 metres below.' (McLeod 1980: 24–25)

Newton remembered his old Mount White deer-shooting mate, Honey Richards, who was:

> '... as tough as whipcord, and when it came to carrying skins, he did not know the meaning of the word quit. Eventually, he finished the winter with a bigger total than myself. No man ever had a better mate, and for such work during a hard winter, it would have been hard to find his equal. He was another of my mates to lose his life overseas ... the loss of such as he is in the nature of a calamity to our back country.' (Newton 1953: 137)

McLeod (1980) recalled that the proprietor of the Bealey Hotel, Reg Ferguson, a first class musterer, 'was always ready to leave his often empty bar and come and help us muster or tail lambs or snowrake sheep when winter whitened the Burnt Face and Bealey Spur', and:

> 'The petrol rationing, which starved the Bealey of its house guests and bar patrons, had its effect on the station also. Three days a week somebody had to go into Cass to collect the mail and bread; 8 kilometres each trip, which used up a good deal of our precious ration. In the trees at the back of the house I found the remains of an old gig, which was still quite sound although it must have lain

there for uncounted years. The wheels were rotten but I still had those which came off the old buckboard which Sealy Rutherford had made to fetch the mail in 1910—which shows what splendid craftsmen those old coach-builders were. I put the two together and made a smart and useful turnout pulled by my old white pony Betsy.'

(McLeod 1980: 33)

When Japan entered the war in 1941, the Government impressed all the trucks that might be of use to the army (Dick 1964). The station's 2-ton Bedford (purchased in 1939) was requisitioned, and the cart became the station's chief vehicle (Dick 1964).

Farmers were asked to collect scrap iron for munitions, and Betty Dick of Lilybank Station remembered the time that their waggon, 'loaded to the hilt with scrap iron', tipped into the Macaulay River:

'No melting-down works ever saw that load of scrap iron, collected at great effort and much inconvenience for the country's war work. But here and there in the old Macaulay evidence of that early morning river crossing can still be seen. For as each flood shifts the shingle it uncovers a little more of some part of an old-time implement or machine, to loom grotesquely against the background of the mountains.' (Dick 1964: 46)

McLeod shared with his neighbour Jim Milliken an old stationary baler driven by a tractor with a long belt that needed several men to work it. Seven men could produce about 500 bales of hay if they worked until nightfall (McLeod 1980). At Christmas 1941, Alwyn Warren, Dean of Christchurch Cathedral, volunteered to help with haymaking (McLeod 1980).

During the war, there were still wild cattle to be dealt with at Mount White Station (McLeod 1980). They had learnt to hide in the bushy gullies across the river at Lochinvar and had grown old and cunning in the art of dodging musterers. Although labour was in short supply, Jock McArthur accepted a contract to get the cattle out (McLeod 1980). Eventually, after much difficulty, he arrived at Mount White with about 70 head of good cattle (McLeod 1980). He had driven them all the way down the narrow 20-km track from 'Nigger Hill', and there was another 30-km drive from the sheep station to Cass to put them on the railway trucks to Addington sale yards (McLeod 1980).

A branch of the Home Guard called the 'Guide Platoons' was formed among the high-country men of both islands (McLeod 1980). The Platoons' role in the event of a Japanese landing was to work from bases in the rugged mountains, guiding defending troops by known tracks, and serving as spies and saboteurs. There were 16 or 17 Platoons in the South Island, strategically placed in remote areas (McLeod 1980). Early in the war, high-country runholders were asked by the Government to bring in extra stores, at their own cost, so that in the event of a surprise attack on the coastline, the stations would be able to accommodate plenty of people from the cities (McLeod 1980). Needless to say, the runholders were sceptical as to how these people would get to their remote stations (McLeod 1980).

7.2.9 Soldier settlement

Fewer returned soldiers were placed on farms after the Second World War than after the First World War. At that earlier time, 373 were settled in Canterbury; by 1950, there were 231 on 157 030 acres (c. 63 597 ha) (Scotter 1965). However, much more money was spent on establishing the men after the Second World War, and there were no failures (Scotter 1965). From 1945, land was still being purchased, usually in the same small areas that had caused problems in the 1920s, but it was bought at the controlled sales price and the returned soldiers were placed on farms as managers or labourers (Scotter 1965). Buildings were constructed, stock bought, improvements made and everything was in running order before the farms were handed over, usually to the manager, who had been given the promise of a lease (Scotter 1965). The successes of the Second World War soldier settlers were helped by a long period of rising prices (Scotter 1965).

Generally, however, there had been too much subdivision in the Canterbury high country, and some runs were amalgamated: Black Forest with Haldon; Jollie with Braemar; and Balmoral with Mount Cook in the Mackenzie Country (Scotter 1965). Tekapo, Rhoboro and McKenzie Peaks were divided among neighbouring stations (Scotter 1965). The twelve soldier settlement runs that had been made from the two original runs of the Lees Valley after the First World War were taken over by the Lands Department in the 1940s and amalgamated into seven runs (Scotter 1965).

7.2.10 Electricity

When Mona Anderson arrived at Mount Algidus Station shortly before the war, there was no electricity. She wrote that:

> 'My first wash-day nearly killed me. I had been used to a washing machine and it took me all morning to get the copper boiling. By the time I had finished rubbing the clothes on a wash-board my fingers were skinned and blistered.' (Anderson 1963: 29)

After the war, trucks took the place of horses and drays, a tractor was purchased, and lamps and candles gave way to electric light. 'There was even a gadget on which you just turned a knob to talk to the people of the gorge' (Anderson 1963: 97). Until 1947, at Grasmere Station oil lamps, candles and a primitive, highly dangerous petrol light had been used (McLeod 1980). That winter, as profits from sheep farming rose, the McLeods investigated possibilities of installing a hydroelectric power plant (McLeod 1980). Three possible sites were: the old water race that came out of Cass Creek and drove a water wheel for crutching at the woolshed; a steep and rocky little stream that came out of the gulch dividing Mount Misery from Mount Horrible; and the outlet from Lake Grasmere. The latter seemed likely to be the most stable and reliable (McLeod 1980). They decided that it was possible to divert the

Grasmere Stream across a piece of ground and that the fall into Sarah Stream would be about 3 m. A turbine that could work with 20–30 cusecs of water at such a low fall was required. Most private power schemes in the South Island used a Pelton Wheel (a high-speed machine using a small amount of water at very high pressure directed through a variable nozzle into little buckets) (McLeod 1980). This needs a small flow of water but a fall of more than 100 m. The Sarah Stream site required a low-pressure turbine. Two were found at Brookside on the Selwyn River/Waikirikiri. The McLeods kept the smaller one and the larger of the two went to provide power for the Ensors at Double Hill in the Rakaia Gorge, where there was a bigger flow of water (McLeod 1980).

With the war recently over, materials were difficult to obtain (McLeod 1980). Ted Salvesen of Wooff and Salvesen, electrical engineers, built a 10 kW generator for Grasmere Station (McLeod 1980). The powerhouse, water race, concrete penstock and power line were constructed using a great deal of do-it-yourself ingenuity, and the system proved durable, lasting for nearly 30 years (McLeod 1980).

7.2.11 Manufacturing

C.W.F. (Bill) Hamilton, who bought Irishman Creek Station in the Mackenzie Country in 1921 (Whelan 1988), built a unique new workshop there in 1938, which was powered by a private hydroelectric plant (Whelan 1988). The workshop was used to manufacture bulldozers and other heavy machinery until the Second World War, when it was converted to making munitions (Whelan 1988). Parts for Bren Gun Carriers, rifles and machine guns were made as well as trench mortars. Seventeen staff were employed, and a small night shift worked during the busiest time (Whelan 1988).

7.2.12 Tourism

Although Hamilton Engineering Works was moved to Christchurch in 1945, the workshop eventually became a Mackenzie Country tourist attraction, with displays of photographs and some of Hamilton's inventions, such as the first jetboat and a model of an earth scoop (Whelan 1988).

From the 1920s, the Mackenzie Country and other high-country districts expanded their range of activities beyond sheep farming (Whelan 1990). The motorcar opened up previously inaccessible areas to visitors, and new technology meant that more New Zealanders had more leisure time. Rivers and lakes were used for fishing, boating and picnicking. Recreational shooting became increasingly popular in the mountains (Whelan 1990).

In the late 1930s, a series of huts made of local adzed timber were constructed on a track across the Southern Alps near Arthur's Pass—possibly the last in New Zealand to be built in this fashion (Historic Resources Directorate 1997).

7.2.13 Mining and quarrying

Mining and quarrying continued on some high-country stations. For example, coal had been discovered on the Mount Somers Run, Canterbury, in 1856; at first, this was used for fuel (Whelan 1990). Later, 'Tripps' mine became a commercial operation, supplying the Buxton Lime Kilns and towns such as Ashburton (Whelan 1990) (Fig. 27). It is the third-oldest and longest continuously worked mine in New Zealand (Whelan 1990).

Coal mining and lime quarrying brought the rail head to Mount Somers township on the upper Ashburton River in 1886 (Whelan 1990). Subsequently, tramways were constructed from the rail heads to the mines and quarries (Whelan 1990). The Mount Somers' runholder of the time, A.E. Peache, built the first part of the existing lime kilns in 1888 using Oamaru Stone (Whelan 1990). The lime was used to supply the Canterbury building trade and also for fertiliser (Whelan 1990). These Buxton lime kilns were closed in 1925, and in 1928 A.E. Vincent bought the lime works and quarry from the Peache Estate (Whelan 1990). Vincent invented a new method of processing lime by dehydrating it and built a concrete hopper in front of the old kilns (Whelan 1990). Between 1928 and 1963, around 18 people worked at the plant, which was then removed to Oamaru (Whelan 1990). In 1942, the Victory Lime Company began quarrying at the Caves on Mount Somers Station (Whelan 1990). There, open-cast quarrying removed the natural limestone caves that had given the area its name.

Since 1861, mining in Otago has left distinctive physical remains on the landscape, such as shafts, water races, reservoirs, sluice faces and tailings. Quartz mining for gold began at Bendigo Station, Central Otago, in 1869 and continued through to 1937 (DOC 1997). Shafts were driven into the hillsides. Further down the Clutha River, at Bannockburn, collapsed coal-mining shafts pock the landscape (DOC 1997).

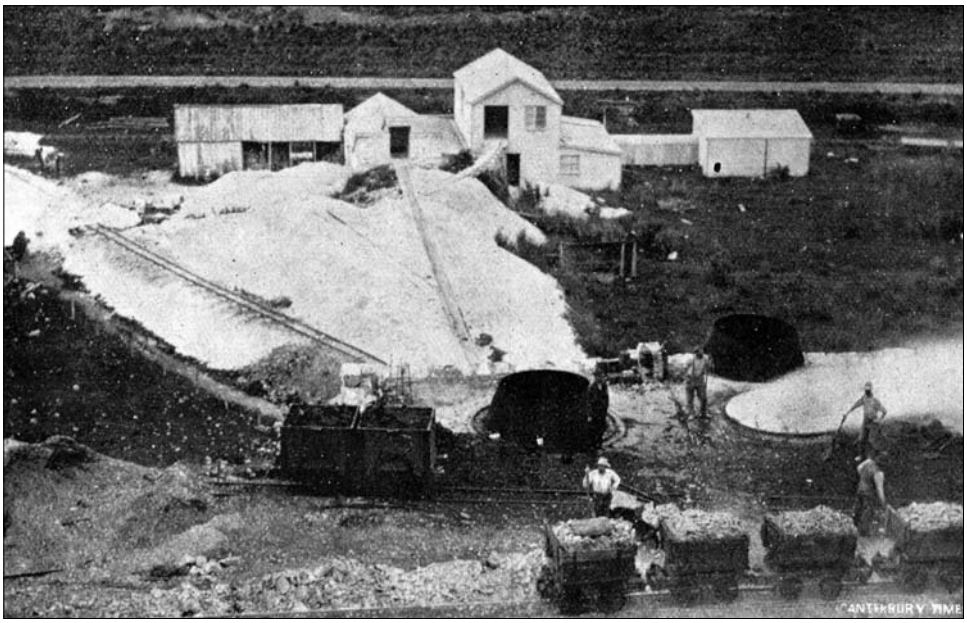

Figure 27. Lime kilns at Mount Somers, 1909. The tops of the bottle kilns are in the foreground. Lime was spread on fields to improve pasture quality. *Photo courtesy of Canterbury Museum (Bishop Collection; reference number CMNZ 12795).*

The findings of Rivers Commissions and Inquiries into pastoral and hill lands, forests and seas fisheries from 1900 revealed the first signs of a shift in attitudes and values towards the mining and quarrying industries (Hearn 2002). Rising concern about the damage inflicted on the environment by these industries appears to be inversely proportional to their declining monetary value (Hearn 2002). Geographer Terry Hearn wrote that:

> 'Controls were only gradually introduced after the costs of unrestrained mining and dumping for water quality and flood control, and the extent of damage to infrastructure and wildlife habitats, became apparent, and only after the community began to realise that it would have to pay for the damage inflicted by companies concerned solely with their own profits. Even then, government attempts at control were intended to resolve conflicts among competing interests rather than to ensure wise resource use.' (Hearn 2002: 98)

7.3 LAND TENURE

The Crown took over the Molesworth Station leases on 28 February 1938 when rabbits were yet again in crisis numbers and high-country farming, after 80 years of extensive grazing, promised to become uneconomic (McLeod 1980). David McLeod reflected that:

> 'In that cataclysmic failure many of us saw the doom of other isolated runs. Where would musterers come from if these rugged training grounds were abandoned? We all had men who had cut their teeth and wrecked their boots on Molesworth's broken shingle.'
>
> (McLeod 1980: 19)

Strychnine had taken the place of guns, dogs and traplines for destroying rabbits, but some people believed that different methods and a more powerful policy, which did not rely on a high price for skins, was needed (McLeod 1980). Sheep prices were falling and numbers were down (McLeod 1980). Initial soil fertility had been exhausted and palatable species of grass had been replaced by those that were more tolerant of fire and grazing. Many farmers thought that wool production per head was lower as well, but this was difficult to prove (McLeod 1980).

7.3.1 The High Country Committee

The two key events of the 1940s were the formation of the High Country Committee and the emergence of the soil conservation movement as a force (Broad 1994). McLeod (1980: 20) wrote that 'Only a real high country man could understand the peculiar problems of our country and there were none on any of the [land] boards'. He and other members of the Runholders' Committee in 1940 met with Frank Langstone, Minister of Lands. Charlie Parker of Holbrook Station, near Tekapo, and also manager

of Rollesby, prepared a comparison of the rents and carrying capacities of the Mackenzie Country stations in 1896 and 1936:

> 'It was a difficult calculation because subdivision had occurred, boundaries had changed and rabbits had spread, but the burden of his song was that rents varied from 7d per sheep to four shillings—in the case of Rollesby—and that the Lands Department had no touchstone by which it judged productivity, but demanded as much as it could get and made no allowances for snow or local conditions.'
>
> (McLeod 1980: 21–22)

After much discussion, Langstone agreed that he would accept the establishment of an advisory board consisting of high-country runholders with whom he and his department could discuss the problems of the area and the administration of the Lands Department (Mcleod 1980). Thus, on 19 April 1940, the High Country Committee came into being, comprising representatives from each of the provincial land districts.

Membership of the first High Country Committee was as follows (McLeod 1980):

Southland:	W.J.A. MacGregor, Mount Linton
Otago:	John Mackenzie, Walter Peak, Queenstown Willis Scaife, Glendhu, Wanaka Arthur Munro, Omarama
Canterbury:	C.A. Parker, Rollesby, Mackenzie R.C. Todhunter, Blackford, Rakaia D. McLeod, Grasmere, Waimakariri
Marlborough:	A.J. Murray, Wharenui, Clarence

The Minister agreed to appoint one high-country man from names submitted by the High Country Committee to each Land Board as seats became vacant (Dominy 2001). Also in 1940, good husbandry clauses were introduced into the conditions of the leases, which limited the number of stock to be wintered on each run (Scotter 1965).

7.3.2 Kai Tahu

The Ngai Tahu Claim Settlement Act 1944 authorised a payment to Kai Tahu of £10,000 a year for 30 years in 'final settlement' of their claims concerning Kemp's Purchase. The amount was based on the £354,000 recommended by the 1921 Royal Commission (Evison 1993). Under a further Act in 1946, the Ngai Tahu Maori Trust Board was authorised to administer the funds provided under the 1944 Act to improve Kai Tahu welfare, mainly through educational benefits (Evison 1993).

Meanwhile, the fragile mahika kai remnants continued to be vulnerable to high-country industry. Natural vegetation that had once soaked up rainwater in the high country of the Southern Alps had been cleared away by runholders, accelerating flooding and erosion, and damaging the natural habitats of birds and fish (Evison 1993). This factor, together with the introduction of predators, caused the decline of native birds, including the weka, in eastern districts (Evison 1993).

7.3.3 The soil conservation movement

The soil conservation movement originated in the United States, where dustbowls created through unsustainable use of the land generated public support for the idea of soil conservation in the 1930s (McCaskill 1973). In New Zealand, the findings of Vladimir Zotov of the Botany Division of the DSIR revealed that burning off, heavy grazing and rabbit infestation had caused serious soil erosion and aggradation of rivers in the South Island high country (Zotov 1938). L.W. McCaskill, a lecturer in agriculture at Christchurch Teachers' College, who had developed an interest in soil erosion and travelled to the United States to study conservation methods, strengthened the interest of the Canterbury Progress League in a vigorous legislative and practical programme of soil conservation (McCaskill 1973). The Progress League began to campaign energetically to educate the public and local bodies, and to put intense pressure on Bob Semple, Minister of Public Works, to take legislative action (McCaskill 1973). This was possibly the first time that people other than runholders and Government demanded a say in the way high-country lands were to be managed (Broad 1994). Although they met strong resistance from runholders, the campaigners won. In 1941, the Soil Conservation and Rivers Control Act was passed (Broad 1994).

A central Soil Conservation and Rivers Control Council was established and catchment districts, each under a Catchment Board, were to be constituted. The boards were to have the power to prohibit the lighting of fires, the destruction of vegetation or any change in the use of land, and to restrict the use of land for agricultural or pastoral purposes (McCaskill 1973). Runholders became concerned that members of catchment boards, who would be elected by city communities, would have extensive powers to govern their lands and lives. They worried that board members might not understand the 'harsh realities' of sheep farming in the high country (McLeod 1980). Meanwhile, according to McLeod, the authorities directed a campaign of propaganda at the 'unwise practices which they said had caused the dangerous state of depletion of our hill and mountain lands' (McLeod 1980: 40). He recalled that the New Zealand sheep farmer was depicted as 'an evil man, a deliberate despoiler of the land, and every slip and shingle slide and rocky outcrop was evidence of the havoc he had wrought' (McLeod 1980: 40). This led to 'a vociferous hostility towards the runholders and demands from the more outspoken critics for the complete closure of all mountain lands' (McLeod 1980: 40). Runholders were again reviled publicly, just as they had been during the Liberal era; although the reasons were different, this attack was similarly launched by urban dwellers.

Afforestation was suggested, in the Waimakariri Basin in particular because of the threat of flood waters from the river to Christchurch (McLeod 1980). The campaign provoked a backlash from the farmers (McLeod 1980). McLeod contended that:

> 'The Act was heavily weighted in favour of flood control, and its administration through the Ministry of Works resulted in an engineering approach to the problems, but the powers it contained and delegated

> to catchments boards were alarming to those who owned or leased land in the river catchments, and the threat to the high-country runholders was very real.' (McLeod 1980: 40)

He also considered that one of the main causes of anxiety was that the Act did not provide compensation to a landholder when an order of the board compelled him to change his land use, for instance by forcing him to change his breed of sheep (McLeod 1980). Fortunately for the runholders, the war delayed the formation of any catchment boards until 1944 (McLeod 1980). Nelson, North Canterbury and South Canterbury were established that year, followed by Southland in 1945, Otago in 1948 and Marlborough in 1956 (McCaskill 1973).

David McLeod replaced R.C. Todhunter as Chair of the High Country Committee in June 1944 (McLeod 1980). Later the same year, the upper Waimakariri Basin was inspected by the new North Canterbury Catchment Board. The occupiers of the six runs with homesteads behind Porters Pass met with the members to 'try to justify their stewardship of this vital river catchment' (McLeod 1980: 43). The low-lying city of Christchurch with its huge property value was threatened by any outbreak of the river from its existing course. The Catchment Board was concerned about the practices of burning and grazing. McLeod recalled:

> 'On the face of it the record was not good. Forested slopes on the Craigieburn Range, in the Esk Valley, and at Cora Lynn, had been fired to produce extra grazing, as a host of blackened stumps bore witness. Dense patches of snow grass had been burnt in high summer by some exasperated musterer after vainly trying to find sheep amongst it—like my own man Arthur Booth the first season I was at Grasmere. Regular burning to get a "green bite" had bared the sunny faces until the creeping shingle pushed down by the elements and the persistent feet of sheep began to obliterate the tussock, which alone could hold the soil in position. In addition to these ill treatments the virgin fertility of the land had led the early runholders to graze the maximum number of sheep which their country could support and, in order to do so they hunted as many as possible of their active merinos out on to the high and sparsely vegetated tops during the hot dry summer period in order to save their winter grazing. In this they were not much more guilty than their overlords of the Lands and Survey Department who placed no restriction on the number of sheep which could be grazed and made no attempt to prevent a runholder who wished to sell from crowding a ridiculous number of sheep on his lease in order to get the best price for the property.' (McLeod 1980: 43–44)

In the event, the runholders were relieved to find little hostility among board members, who included George Jobberns, Chairman of the Soil Conservation Committee; Lance McCaskill, a knowledgeable alpine botanist; R.M.D. (Peter) Johnson, a runholder who controlled a huge section of the Torlesse Range; and Tom Preston, Commissioner of Crown Lands (McLeod 1980).

The High Country Committee had several meetings with the combined North and South Canterbury boards, and gradually a mutually satisfactory

policy evolved. The boards decided on a policy of issuing permits to burn where it could be shown to be necessary, and resolved to set up a series of trials in different areas in an attempt to establish the facts about the vegetation before pursuing any particular policy (McLeod 1980). The trials consisted of fenced plots and line transects from which regular readings were taken to indicate whether the vegetation was increasing or decreasing (McLeod 1980).

The runholders still felt in need of some protection, however—the authority of the boards was enormous—and after a struggle, a concession was made (McLeod 1980). The principle of grants and subsidies to compensate for the loss of grazing on eroded lands was accepted.

Another pressing problem was how to make ends meet with the very low wool prices fixed by the 'commandeer' (McLeod 1980). The top price received for Grasmere wool during the first 3 years of the war was only 15 pence a pound, and the average price 11 pence (McLeod 1980). With the assistance of the Canterbury Sheepowners' Union, a deal was reached in secret to have a larger share of the total funds allocated to the high-country runholders (McLeod 1980). At Grasmere, the change resulted in a rise of about twopence a pound, adding £500 or £600 to the station's income (McLeod 1980).

After the war, the High Country Committee approached the Government because its members believed that the price of fine wools was still at an uneconomic level (McLeod 1980). The Wool Board had recently been formed (McLeod 1980). A meeting was held in August 1945 with the North and South Canterbury Catchment Boards 'at which they agreed that pastoral occupation of the high country was still desirable and that it was in the interests of soil conservation that it should be profitable' (McLeod 1980: 104). The committee obtained an interview in Wellington with C.F. (Jerry) Skinner, Minister of Lands, and Ben Roberts, Minister of Agriculture (McLeod 1980). The deputation consisted of Bill Machin, representing the catchment boards, Noel Jamieson, Chairman of the Wool Board, Harry Wardell, a high-country runholder and member of the Wool Board, and David McLeod. Before they could get an answer from their submissions, the British Government called a conference in London to discuss the disposal of a great stockpile of wool that had accumulated under the wartime commandeering and subsequent marketing systems (Mcleod 1980). McLeod wrote:

> 'Australia, New Zealand and South Africa had sent delegations—ours led by Walter Nash—and until this issue was resolved it was obvious that we could not hope for any adjustment to the price of our fine wools, and that all our energies must be directed towards improving the administration of our lands and making satisfactory arrangements with the all-powerful catchment boards.' (McLeod 1980: 105)

At the same time, a move developed to amalgamate the farmers' organisations throughout the country (McLeod 1980). The main organisations were the Sheepowners' Federation (the 'squatters'), to which the majority of the South Island high-country landholders belonged, and the Farmers' Union (the 'cockies'); there was mutual antipathy between these. Because a

united farming front was urgently needed, leaders from both organisations sank their differences to form the Federated Farmers of New Zealand in 1946 (McLeod 1980). Its formation gave the High Country Advisory Committee the opportunity to put itself on a sound basis (McLeod 1980). The South Island High Country Committee of Federated Farmers was established as the advisory body to the Minister of Lands, with elected officials from each high-country region sitting on the High Country Committee (Dominy 2001). The committee still retains its original right and purpose, which is to act as an advisory body to the Minister of Lands on matters concerning the South Island high country (McLeod 1980).

7.3.4 The Royal Commission on sheep farming

The Federation accepted responsibility for the 'reasonable' expenses of the South Island High Country Committee and the North Island hill-country farmers formed a similar organisation (McLeod 1980). Those in the north who, like the high-country farmers, farmed less productive country, had also suffered from the fixed prices for meat and wool during the war and as a consequence of the Government's stabilisation policy (McLeod 1980). A demand arose for the appointment of a Royal Commission to examine the condition of farming throughout both islands, with special attention to the poorer hill country (McLeod 1980). A commission had already been proposed in 1939 but the idea was abandoned when war broke out (McLeod 1980).

The Royal Commission on the Sheep Farming Industry was appointed in August 1947 and included Willis Scaife, sheep farmer of Wanaka, who was a member of the original South Island High Country Committee (McLeod 1980). Others were R.H. White, sheepfarmer of Otane; Richard Eddy, MLC; L.C. Gardiner, sheepfarmer of Waiau; W.F. Metcalfe, sheep farmer of Te Araroa; and H.W. Youren, sheep farmer of Napier (White et al. 1948). McLeod, Harry Wardell, Arthur Munro, Charlie Parker and others had many meetings and long hours of work preparing the high-country case (McLeod 1980).

The introduction of the Rabbit Nuisance Amendment Act 1947 finally led to the loss of any commercial incentive to destroy rabbits or to let them breed for skins or meat (Grey 1994). Long rabbit fences, such as that from Tasman Glacier to Hakataramea, had not worked; ferrets killed birds and ate eggs in preference to rabbits; and strychnine and carrots were effective only for a while (Scotter 1965). Rabbiting had become a business—in 1948, skins were valued at £10 per hundred. The new act set up a Rabbit Destruction Council as well as Rabbit Boards with rating powers. Rabbit skins were progressively devalued by instituting a levy of 10% (this gradually increased, until by 1956 the sale and export of skins and carcasses was prohibited) (Scotter 1965; McCaskill 1973). It was hoped that new poisons, soon to be spread by aeroplane, would make the 'killer' policy effective (McCaskill 1973).

7.3.5 The Land Act 1948

McLeod was absorbed in the preparation of the high-country farmers' case to be presented to the Royal Commission on the Sheep Farming Industry (McLeod 1980). He and others in the lobby group were determined to indict the administration of the Lands Department and to make their evidence as powerful and as well documented as possible (McLeod 1980). McLeod presented the local case to the Royal Commission on Sheep Farming at Christchurch and the submissions were well received on several points. McLeod and Wardell presented Canterbury's case in Wellington, and afterwards the Commission left on its tour of the North Island. During this tour, Jerry Skinner, Minister of Lands, made the shock announcement that a new Land Act was to supercede the Land Act 1924 (McLeod 1980).

The Royal Commission published interim reports in April and June 1948. Dominated by sheep farmers, its advice was firmly practical and designed to give immediate support to the industry (White et al. 1948). Because sheep farms were situated in the high country, on land of low natural fertility, the commissioners wanted cheap lime and fertiliser to be readily available, and warned that post-war increases in prices had 'resulted in the diminished manuring of marginal country, which can only lead to a rapid pasture deterioration. Such deterioration should be viewed as a national disaster to-day' (White et al. 1948: 9). They recommended the reintroduction of a subsidy for superphosphate, the reduction of the high cost of transporting fertiliser to backcountry farmers on marginal land, and the establishment of a special Snow Losses Reserve Account for high-country farmers prone to insecurity and losses arising from snow risks (White et al. 1948).

A reserve account for snow losses was set up, and the South Island High Country Committee chalked this up as a victory (McLeod 1980). The law, passed as part of a finance bill, provided that a farmer in country liable to severe snowstorms might put into a Snow Loss Reserve such part of his income as he thought fit and draw it out to supplement his income after a loss (McLeod 1980).

The Director-General of Lands, David Greig, had been alarmed by the high-country runholders' strong criticism of his department, and McLeod considered that the Land Act 1948, for which Greig must have been largely responsible, 'was a wise and far-reaching piece of legislation designed to make fundamental changes in the whole approach to pastoral land administration, and to take into consideration the emergence of soil conservation as a factor in the Lands Department responsibility' (McLeod 1980: 129). The health of tussock grasslands was at a low point, and public concern for soil conservation shaped the Crown's reluctance to allow for the permanent alienation of the high country; even fertile lowlands were threatened by high-country erosion (Dominy 2001: 237).

The Land Act 1948 did not allow for the freeholding of high-country land. Instead, it provided the security of tenure necessary to encourage improvement with perpetually renewable 33-year leases. High rents and insecurity of tenure had been encouraging overstocking (Scotter 1965). The rights of the Crown were protected and the Lands Department was able to make changes that benefited the entire area (Scotter 1965).

Journalist Harry Broad wrote that 'By 1948, concerns about soil erosion were so strong that it was felt the high country was too fragile, and was a special case requiring government to retain ownership of the land' (Broad 1994: 65), and that 'growing concerns over the state of the land led to the deal in the 1948 Land Act, whereby in return for accepting the need for soil conservation, runholders were given perpetual tenure' (Broad 1994: 44). The act was complemented by a raft of new management practices, and the high country was to enjoy 40 years of relative prosperity (Broad 1994).

The 1948 Land Act replaced pastoral licences with leases that gave:

- Perpetual right of renewal for terms of 33 years (although rent could be reviewed every 11 years)
- Exclusive occupation and quiet enjoyment of leases, with lessees having the right to control access under trespass law
- Exclusive rights of pasturage over the land within the lease area, with a stock limitation applying
- Ownership of structural and development improvements, including buildings, fences and pasture improvements, such as fertility, vegetation, and pasture quality and quantity (with lessees free to sell this interest subject to the approval of the Commissioner of Crown Lands)
- A fixed basis for rental, rental being fixed by statute to a percentage of the value of land exclusive of improvements, and therefore not being a market rental

Lessees had no right to the soil or to use the land for any purpose other than for grazing, and were obliged to ensure that the land was free from wild animals, to keep waterways free from weeds and to clear the land of all noxious weeds.

The Crown had rights to ownership of the land exclusive of improvements and the rights to control land uses (Anon. 1959). Examples of land uses include:

- Changes to stock limitation
- Burning of tussock, scrub, fern or grass
- Cultivation, cropping and grassing
- The clearing of bush or scrub
- Afforestation
- Non-farming commercial activities, including recreation and tourism

The Land Act 1948 repealed 78 other acts or parts of acts. Its aim was to give the Crown lessee maximum rights, working on the principle that a secure tenure is the basis of farming progress (McLintock 1966). The Land

Settlement Board was reconstituted and private farmer members added. It became the chief executive arm of the Department of Lands and Survey with power to delegate to departmental officers and to Land Settlement Committees in each of the 12 land districts (McLintock 1966). High-country runholders were the only permanent leaseholders who were not given the right to freehold. The 33-year renewable lease was established as the standard tenure for Crown leases (McLintock 1966). Farm land was to be disposed of by ballot at fixed values under three options: renewable lease, deferred payments or cash (McLintock 1966).

A special branch of the Lands Department was created, with a Chief Pastoral Lands Officer and provision for four district Pastoral Lands Officers who had access through their chief to the Lands Settlement Board in Wellington. This system of administration was headed by an ex-high-country manager, Ted Relph, 'whose dedication and determination made him a powerful advocate on our behalf' (McLeod 1980: 130). However, 'The system was rather less popular with the Commissioners of Crown Lands, who had previously had sole authority in their districts, because they now had in their offices men who were directly responsible to someone else, and ultimately to a higher body' (McLeod 1980: 130). Relph set rents as low as possible to encourage runholders to adhere to stock limitations for the purpose of soil conservation (McLeod 1980).

Although the Land Act 1948 did not give the right of freehold to South Island high-country lessees, it still gave them a secure tenure. Since the South Island high country encompassed most of the eastern watershed of the South Island and much of that land was prone to erosion, the Government decided that it was in the national interest to keep control over the use made of it (McLeod 1980). Rents on pastoral land were based on stock carrying capacities and a clause in each lease limited the number of stock allowed to be carried. As leases expired under former Land Acts, they were to be renewed under the Land Act 1948 (McLeod 1980). Figure 28 shows the South Island Crown pastoral leases that were still extant in 2002.

The final report of the Sheep Industry Commission, published in July 1949, reinforced the views and interest of runholders. The commissioners did not regard erosion as a matter of national consequence to the sheep industry, nor did they see any justification for the scaremongering that had roused public opinion (McCaskill 1973: 226). They contended that if their recommendations were followed, erosion would not accelerate throughout New Zealand (McCaskill 1973: 226). They attacked the Soil Council vociferously and recommended that Catchment Boards be abolished (McCaskill 1973).

In subsequent years, the South Island High Country Committee operated with a heightened sense of urgency because the emergence of an urban-based economic elite and the movement of the agricultural sector to the periphery diminished both the influence and prosperity of runholders (Dominy 2001). Conservation, environmental and recreational interest groups such as acclimatisation societies, the Royal Forest and Bird Protection Society (1984), and Federated Mountain Clubs (1983)

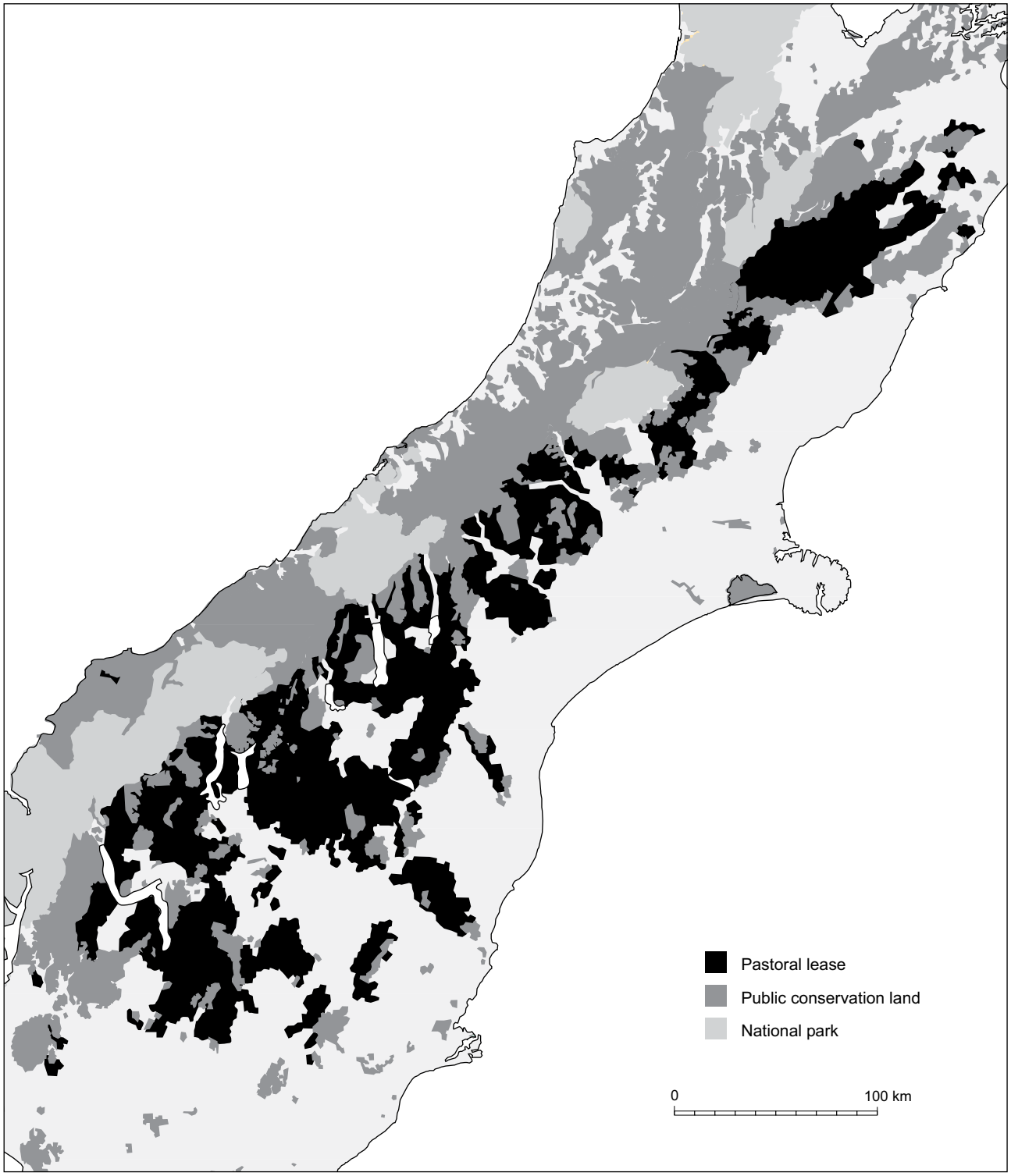

Figure 28. Map of South Island pastoral lease areas c. 2002, based on a Land Information New Zealand map.

actively asserted their interest in public mountain lands (Dominy 2001). Globally, with mountain ecology and sustainable development under scrutiny, tensions between cultural-heritage conservation and natural-area management dominated struggles over high-country protected lands (Dominy 2001).

Broad (1994) stated that the amendment to the Treaty of Waitangi Act in 1985 allowing Maori to lodge claims back to 1840, and their subsequent largely successful claims restored Kai Tahu as major players in the high country. He argued that the emergence of new stakeholders with a different vision for the land, and the re-emergence of Maori as a force shattered the comfortable complacency of the previous administration system. Increasingly, the cultural supremacy of pastoralism is being challenged not only by these new stakeholders, but also by change from within the runholders' ranks, from those who wish to explore alternatives to finewool farming (Broad 1994).

7.4 SUMMARY

7.4.1 General historical features

- Extensive areas of depleted and eroded high country resulted from decades of burning off, overstocking, grazing and depredation by rabbits
- The spread of introduced weeds continued unabated
- Noxious animals infested the high country and denuded the land: wild cattle, deer, pigs, goats and Canadian geese
- Wilding trees intruded into the landscape
- Sheep numbers declined
- Rabbit skins were marketed domestically and overseas
- Parts of some high-country stations were regrassed
- The Crown resumed control of Molesworth, Tarndale, Dillon and St Helens Runs because they had become ecologically and economically disastrous
- The Crown took remedial action to exterminate rabbits and other pests, and to control burning off, stocking and grazing on these stations
- The stations taken back by the Crown were restocked with cattle
- The High Country Committee was formed in 1940
- The soil conservation movement became a force in the 1940s and the Soil Conservation and Rivers Control Act 1941 was passed
- There was a shortage of manpower during the Second World War
- 'Killer' rabbit boards were established
- High-country stations were increasingly mechanised, e.g. motor lorries began to replace packhorses
- The rural population declined partly because of increased mechanisation

- The number of merino sheep declined in the high country, while that of Romney sheep rose throughout New Zealand
- The price of wool was controlled during the Second World War
- Heavy machinery and wartime armaments were manufactured at Irishman Creek Station in the Mackenzie Country
- Guide Platoons were formed in the high country as part of the Home Guard during the war
- The Ngai Tahu Claim Settlement Act 1944 authorised payment to Kai Tahu as compensation for Kemp's Purchase
- Catchment boards were established in 1944 to control flooding
- The price of wool escalated in the post-war period
- A period of prosperity ensued for the high country
- There was much post-war construction of station buildings, fences and hydroelectric plants
- Soldier settlements were established
- Mustering continued along traditional routes
- Light aircraft began to be used for dropping rabbit poison, to assist with mustering and for emergencies
- A radio telephone network began to emerge
- Other formerly subdivided runs that had proved to be uneconomic were amalgamated
- Coal mining, gold mining and lime quarrying continued on some stations
- Transport became increasingly streamlined: roads, railways and air services expanded, new bridges were built, and more private motorcars and other motorised vehicles appeared on the road
- An increasing number of tourists visited the high country
- The Royal Commission on the Sheep Farming Industry was appointed in 1947 and provided interim reports in 1948
- The Rabbit Destruction Amendment Act 1947 was passed
- The Land Act 1948 was passed giving security of tenure to runholders, taking into consideration soil conservation as a factor, and introducing new land management practices

7.4.2 Key physical resources

- Depleted and eroded high-country land
- Exotic weeds
- Noxious animals
- Wilding trees
- Experimental plots for testing grass seed and the effects of burning
- Regrassed high-country areas
- Native grasses, which reappeared after the rehabilitation of some high-country stations
- Rabbit-pelt presses
- Cattle yards and fences
- Mustering routes: tracks and huts
- Cattle- and sheep-droving tracks
- Stationary hay balers
- Heavy machinery and armaments manufacturing site at Irishman Creek Station
- Drays and other horse-drawn vehicles reconstructed for use during the Second World War
- Tracks and huts used during the Second World War by the Guide Platoons
- Motorcars and lorries, jeeps, limespreaders, and light aircraft
- Post-war station buildings and fences
- Hydroelectric plants: powerhouses, water races, penstocks and power lines
- Coal mines, lime works and quarries: concrete hoppers, mine shafts, water races, reservoirs, sluice faces, tailings and tramways
- Tourist huts, hotels, tracks and boats
- Flood control systems
- Forests planted to prevent soil erosion

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